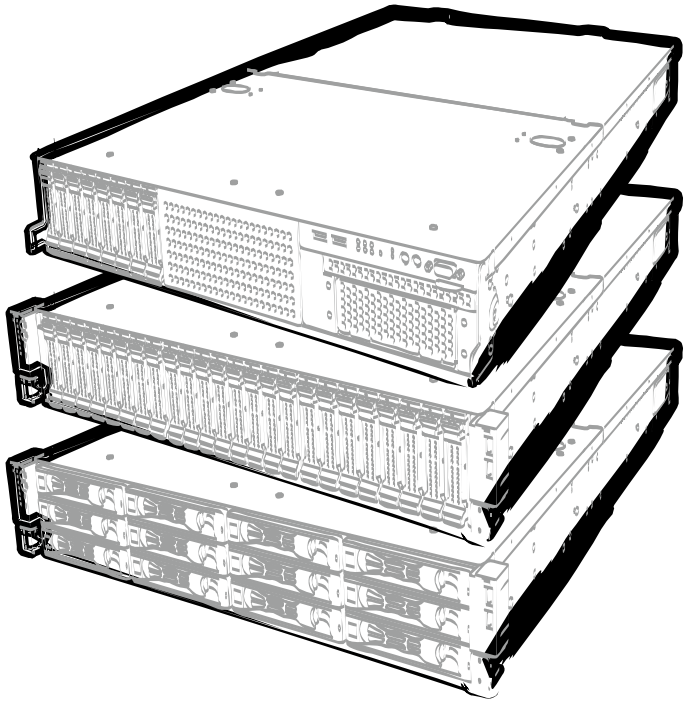
Express5800

NEC



NEC Express Server
Express5800 Series

Express5800/R120d-2E
EXP481A
User's Guide

Model Number: R120d-2E: N8100-1950F/1951F/1952F/1953F

Chapter 1 General Description

Chapter 2 Preparations

Chapter 3 Setup

Chapter 4 Appendix

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Documents Provided with This Product

Documents for this product are provided as accompanying booklets and as electronic manuals stored within the EXPRESSBUILDER DVD.

Precautions for Use	Describes points of caution to ensure the safe use of this server. **Read these cautions before using this server.**
Getting Started	Describes how to use this server, from unpacking to operations. Refer to this guide as you begin for an overview of this server.

EXPRESSBUILDER

User's Guide

Chapter 1: General Description	Overviews, names, and functions of the server's parts
Chapter 2: Preparations	Installation of additional options, connection of peripheral devices, and ideal location for this server
Chapter 3: Setting Up Your Server	System BIOS configurations and summary of EXPRESSBUILDER
Chapter 4: Appendix	Specifications and other information

Installation Guide (Windows)

Chapter 1: Installing Windows	Installation of Windows and drivers, and important information for installation
Chapter 2: Installing the Bundled Software	Installation of bundled software, such as NEC ESMPRO and Universal RAID Utility

Maintenance Guide

Chapter 1: Maintenance	Server maintenance and troubleshooting
Chapter 2: Convenient Features	Useful features and the detail of system BIOS settings, RAID Configuration Utility, and EXPRESSBUILDER
Chapter 3: Appendix	Error messages and Windows Event Logs

Other documents

Provides the detail of NEC ESMPRO, Universal RAID Utility, and the other features.

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Notations Used in This Document

Notations used in the text

In addition to safety-related symbols urging caution, 3 other types of notations are used in this document. These notations have the following meanings.

Important	Indicates critical items that must be followed when handling the server or operating software. If the procedures described are not followed, **server failure, data loss, and other serious malfunctions could occur**.
Note	Indicates items that must be confirmed when handling the server or operating software.
Tips	Indicates information that is helpful to keep in mind when using this server.

Optical disk drives

This server is equipped with one of the following drives, depending on the order at the time of purchase. These drives are referred to as *optical disk drives* in this document.

- **DVD-ROM drive**
- **DVD Super MULTI drive**

Hard disk drives

Unless otherwise stated, hard disk drives (HDD) described in this document refer to the following.

- **Hard disk drives (HDD)**
- **Solid state drive (SSD)**

Removable media

Unless otherwise stated, removable media described in this document refer to the following.

- **USB memory**
- **Flash FDD**

Abbreviations of Operating Systems (Windows)

Windows Operating Systems are referred to as follows.

Refer to *Chapter 1* (*1.2 Supported Windows OS)* in *Installation Guide (Windows)* for detailed information.

Notations in this document	Official names of Windows
Windows Server 2008 R2	Windows Server 2008 R2 Standard
	Windows Server 2008 R2 Enterprise
Windows Server 2008 *1	Windows Server 2008 Standard
	Windows Server 2008 Enterprise
Windows Server 2003 R2 x64 Edition	Windows Server 2003 R2 Standard x64 Edition
	Windows Server 2003 R2 Enterprise x64 Edition
Windows Server 2003 R2 *2	Windows Server 2003 R2 Standard
	Windows Server 2003 R2 Enterprise
Windows Server 2003 *2	Windows Server 2003 Standard
	Windows Server 2003 Enterprise
Windows 7	Windows 7 Professional 64-bit(x64) Edition
	Windows 7 Professional 32-bit(x86) Edition
Windows Vista	Windows Vista Business 64-bit(x64) Edition
	Windows Vista Business 32-bit(x86) Edition
Windows XP	Windows XP Professional x64 Edition
	Windows XP Professional
Windows PE *3	Windows Preinstallation Environment

*1: Includes 64-bit and 32-bit Editions unless otherwise stated.
The following appears on EXPRESSBUILDER.

- Windows Server 2008 64-bit Edition: Windows Server 2008 x64
- Windows Server 2008 32-bit Edition: Windows Server 2008 x86

*2: Unless otherwise stated, Windows Server 2003 R2 and Windows Server 2003 are collectively referred to as Windows Server 2003.

*3: Used as an installation platform only.

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This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Industry Canada Class A Emission Compliance Statement

This Class A digital apparatus complies with Canadian ICES-003.

Avis de conformité à la réglementation d'Industrie Canada

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

CE / Australia and New Zealand Statement

This is a Class A product. In domestic environment this product may cause radio interference in which case the user may be required to take adequate measures (EN55022).

BSMI Statement

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EU-wide legislation as implemented in each Member State requires that used electrical and electronic products carrying the mark (left) must be disposed of separately from normal household waste. This includes Information and Communication Technology (ICT) equipment or electrical accessories, such as cables or DVDs.

When disposing of used products, you should comply with applicable legislation or agreements you may have. The mark on the electrical and electronic products only applies to the current European Union Member States.

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Turkish RoHS information relevant for Turkish market
EEE Yönetmeliğine Uygundur

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Keep this document nearby so that you may refer to it as necessary.

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The most recent version of User's Guide, as well as other related documents, is also available for download from the following website.

http://www.nec.com/

Precautions for Use (Be Sure to Read)

The following provides information required to use your server safely and properly. For details of names in this section, refer to *Names and Functions of Parts* in this document.

Safety precautions

Follow the instructions in this document for the safe use of the NEC Express server.

This User's Guide describes hazardous parts of the server, possible hazards, and how to avoid them. Server components with possible danger are indicated with a warning label placed on or around them (or, in some cases, by printing the warnings on the server).

In User's Guide or on warning labels, **WARNING** or **CAUTION** is used to indicate a degree of danger. These terms are defined as follows:

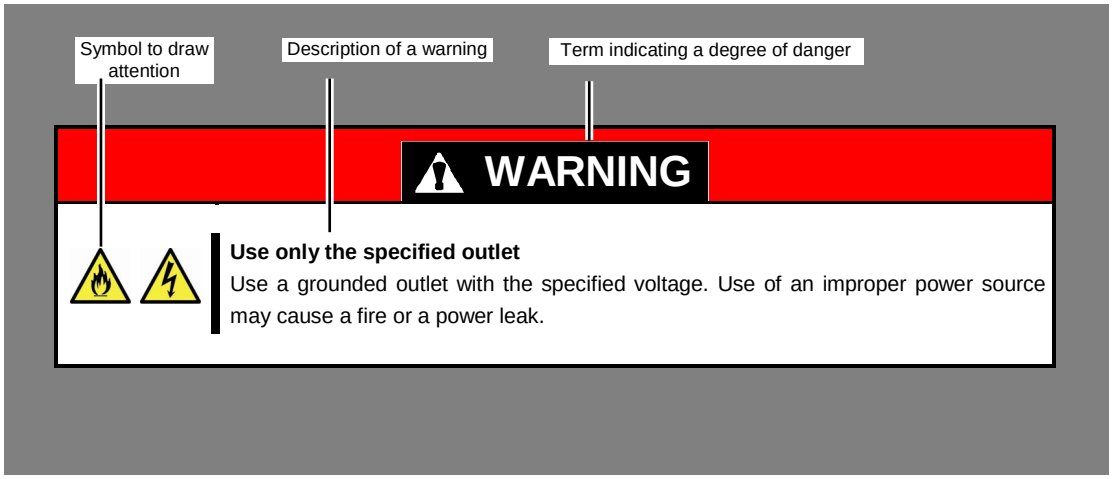
WARNING Indicates there is a risk of death or serious personal injury

CAUTION Indicates there is a risk of burns, other personal injury, or property damage

Precautions and notices against hazards are presented with one of the following three symbols. The individual symbols are defined as follows:

	Attention	This symbol indicates the presence of a hazard if the instruction is ignored. An image in the symbol illustrates the hazard type.	(Example) (Electric shock risk)
	Prohibited Action	This symbol indicates prohibited actions. An image in the symbol illustrates a particular prohibited action.	(Example) (Do not disassemble)
	Mandatory Action	This symbol indicates mandatory actions. An image in the symbol illustrates a mandatory action to avoid a particular hazard.	(Example) (Disconnect a plug)

(A label example used in this User's Guide)


Symbol to draw attention
Description of a warning
Term indicating a degree of danger
WARNING
Use only the specified outlet
Use a grounded outlet with the specified voltage. Use of an improper power source may cause a fire or a power leak.

Symbols used in this document and on warning labels

Attentions

	Indicates the presence of electric shock hazards.		Indicates the presence of mechanical parts that can result in bodily injury.
	Indicates the presence of a hot surface or component. Touching this surface could result in bodily injury.		Indicates the presence of mechanical parts that can result in pinching or other bodily injury.
	Indicates there is a risk of explosion.		Indicates the presence of laser beam that cause blindness.
	Indicates there is a risk of fire or fumes.		Indicates a general notice or warning that cannot be specifically identified.

Prohibited Actions

	Do not disassemble, repair, or modify the server. Otherwise, an electric shock or fire may be caused.		Do not touch the server with wet hand. Otherwise, an electric shock may be caused.
	Do not touch the component specified by this symbol. Otherwise, an electric shock or burn may be caused.		Do not use the server in the place where water or liquid may pour. Otherwise, an electric shock or fire may be caused.
	Do not place the server near the fire. Otherwise, a fire may be caused.		Indicates a general prohibited action that cannot be specifically identified.

Mandatory Actions

	Unplug the power cord of the server. Otherwise, an electric shock or fire may be caused.		Indicates a mandatory action that cannot be specifically identified. Make sure to follow the instruction.
	Make sure equipment is properly grounded. Otherwise, an electric shock or fire may be caused.		

Safety notes

This section provides notes on using the server safely. Read this section carefully to ensure proper and safe use of the server. For symbols, refer to *Safety precautions*.

General

⚠ WARNING

Do not use the server for services where human life may be at stake or high reliability is required.

This server is not intended for use in medical, nuclear, aerospace, mass transit or other applications where human life may be at stake or high reliability is required, nor is it intended for use in controlling such applications. We disclaim liability for any personal injury and property damages caused by such use of this server.

Do not use the server if any smoke, odor, or noise is present.

If smoke, odor, or noise is present, immediately turn off the server and disconnect the power plug from the outlet, then contact the store where you purchased the product or your maintenance service company. Using the server in such conditions may cause a fire.

Do not insert needles or metal objects.

Do not insert needles or metal objects into ventilation holes in the server or openings in the optical disk drive. Doing so may cause an electric shock.

Use a rack that conforms to the designated standard

This server can be mounted onto a 19-inch rack that conforms to EIA standards. Do not mount the server onto any rack that does not conform to EIA standards. Doing so may cause a server malfunction, personal injury, or damage to peripheral devices. For more information about racks that can be used with the server, consult with your maintenance service company.

Use the server only under the specified environment

Do not install the server rack in any environment that is not suitable for installation.

Installation in an unsuitable environment is harmful for the server and other systems installed in the rack and may cause fire or personal injury due to the rack falling. For a detailed explanation on installation environments or seismic reinforcement, consult with the instruction manual supplied with the rack or your maintenance service company.

⚠ CAUTION

Keep water or foreign matter away from the server.

Do not let any liquid such as water or foreign materials including pins or paper clips enter the server. Failure to follow this warning may cause an electric shock, a fire, or failure of the server. When such things accidentally enter the server, immediately turn off the power and disconnect the power plug from the outlet. Do not disassemble the server, and contact the store where you purchased the product or your maintenance service company.

Rack installation

CAUTION

Do not attempt to carry or install the server alone

More than two people are required to carry or install the rack. Otherwise, the rack may fall, resulting in personal injury or damage to peripheral devices. In particular, tall racks such as a 44U rack become unstable unless steadied with a stabilizer. Make sure that two or more people hold the rack to carry or install the rack.

Do not install with the load weight distributed unevenly

To avoid unevenly distributing the load of the rack and server, install a stabilizer or connect multiple racks to distribute the weight. Otherwise, the rack may fall, resulting in personal injury.

Do not install components alone, and check the door hinge pins of the rack

Two or more people are required to install the rack components such as the door or rails. When installing the door, make sure that both upper and lower hinge pins are held in place. Incomplete attachment may cause components to fall off as well as personal injury.

Do not extend any device from the rack that is not stabilized

When extending a device from the rack, make sure that the rack is stable (by using a stabilizer or seismic reinforcement). Otherwise, the rack may fall, resulting in personal injury.

Do not extend more than one device out of the rack

Extending multiple devices from the rack may cause the rack to fall, resulting in personal injury. Extend only one device at one time.

Do not exceed the rated capacity of the power supply when connecting devices

To prevent burn injuries, fire, and damage to the server, make sure the load on the branch circuit that supplies power to the rack will not exceed the rated load. For inquiries regarding the installation or wiring of the power supply system, consult with the company that performed the installation or wiring, or the power company that services your area.

Power supply and power cord use

⚠ WARNING

Do not hold the power plug with a wet hand.

Do not disconnect/connect the plug while your hands are wet. Failure to follow this warning may cause an electric shock.

Do not connect the ground wire to a gas pipe.

Never connect the ground wire to a gas pipe. Failure to follow this warning may cause a gas explosion.

⚠ CAUTION

Plug in to a proper power source.

Use a grounded outlet with the specified voltage. Use of an outlet with a voltage other than that specified causes fire and electrical leakage. Do not install the server in any environment that requires an extension cord. Connecting to a cord that does not conform to the power supply specs of the server causes overheating, resulting in fire.

If you want to use an AC cord set with a ground wire of class 0I, be sure to connect the ground wire before inserting the power plug into the outlet. Before disconnecting the ground wire, be sure to disconnect the power plug from the output.

Do not connect many cords into a single outlet by using extension cords.

The electric current exceeding the rated flow overheats the outlet, which may cause a fire.

Insert the power plug into the outlet as far as it goes.

Heat generation resulting from a halfway inserted power plug (imperfect contact) may cause a fire. Heat will also be generated if condensation is formed on dusty blades of the halfway inserted plug, increasing the possibility of fire.

Do not use any unauthorized interface cable.

Use only the interface cables provided with the server. Electric current that exceeds the amount allowed could cause fire. Also, observe the following precautions to prevent electrical shock or fire caused by a damaged power cord.

- Do not stretch the cord harness
- Do not bend the power cord.
- Do not twist the power cord
- Do not step on the power cord.
- Uncoil the power cord before use
- Do not secure the power cord with staples or equivalents
- Do not pinch the power cord
- Keep chemicals away from the power cord
- Do not place any object on the power cord
- Do not alter, modify, or repair the power cord
- Do not use a damaged power cord (replace the damaged power cord with a power cord of the same standard. For information on replacing the power cord, contact the store where you purchased the product or a maintenance service company)

⚠ CAUTION

Do not use the attached power cord for any other devices or usage.

The power cord that comes with your server is designed aiming to connect with this server and to use with the server, and its safety has been tested. Do not use the attached power cord for any other purpose. Doing so may cause a fire or an electric shock.

Do not pull out a cable by gripping the cable part.

Pull a cable straight out by gripping the connector part. Pulling a cable by gripping the cable part or applying extra pressure to the connector part may damage the cable part, which may cause a fire or electric shock.

Installation, relocation, storage, and connection

⚠ CAUTION

Do not attempt to lift the server by yourself

Some servers weigh up to 30 kg depending on the server components. Carrying the server by yourself may damage your back. At least two people should securely hold the server from the bottom when carrying it. Do not hold the front bezel to lift the server. The front bezel may be disengaged from the server, causing personal injury. Hold the server firmly by its bottom.

Do not install the server in any place other than specified.

Do not install the server in the following places or any place other than specified in this User's Guide. Failure to follow this instruction may cause a fire.

- A dusty place
- A humid place such as near a boiler
- A place exposed to direct sunlight
- An unstable place

Do not use the server in an environment where corrosive gas is present

Do not install the server in a place subject to corrosive gases including sodium chloride, sulfur dioxide, hydrogen sulfide, nitrogen dioxide, chlorine, ammonia, or ozone. Do not install the server in an environment that contains dust, chemicals that accelerate corrosion such as NaCl or sulfur, or conductive materials. Failure to follow this warning may cause the wiring on the printed wiring board to short-circuit, leading to fire. If you have any questions, contact the store where you purchased the product or a maintenance service company.

Do not install the server while the cover is removed

Do not install the server to a rack while the cover or other relevant items removed. Not only will the cooling effect within the server decrease, causing the server to malfunction, but also may allow dust to enter the server, resulting in fire or electrical shock.

Do not get your fingers caught in the rails

When mounting/removing the server onto/from the rack, be careful to avoid getting your fingers caught in the rails or cutting your fingers on the rails.

⚠ CAUTION

Do not apply any weight on the server when it is extended from the rack

Do not apply force on the server when it is extended from the rack. Doing so cause the frames to bend, which makes it impossible to be mounted on the rack. It also may cause the server to fall, resulting in personal injury.

Do not attempt to connect or disconnect the interface cable while the power cord is plugged into an outlet

Be sure to unplug the power cord from a power outlet before connecting/disconnecting any interface cable to/from the server. If the server is off-powered but its power cord is plugged to a power source, touching a cable or connector may cause an electric shock or a fire resulted from a short circuit.

Use only the specified interface cable.

Use only interface cables provided by NEC and locate a proper device and connector before connecting a cable. Using an authorized cable or connecting a cable to an improper destination may cause a short circuit, resulting in a fire.
Also, observe the following notes on using and connecting an interface cable.

- Do not use any damaged cable connector.
- Do not step on the cable.
- Do not place any object on the cable.
- Do not use the server with loose cable connections.
  Do not use any damaged cable.

Cleaning and working with internal devices

⚠ WARNING

Do not disassemble, repair, or alter the server.

Never attempt to disassemble, repair, or alter the server on any occasion except as described in this document. Failure to follow this warning may cause not only malfunction of the server but also an electric shock or fire.

Do not attempt to remove lithium, NiMH, or Li-ion batteries.

The server contains the lithium, NiMH, or Li-ion battery (some optional devices have a lithium, NiMH, or Li-ion battery installed). Do not remove the battery. Placing a battery close to a fire or in the water may cause an explosion.

When the server does not operate appropriately due to the dead battery, contact the store you purchased the product or your maintenance service company. Do not attempt to disassemble the server to replace or recharge the battery by yourself.

Disconnect the power plug before cleaning the server.

Be to power off the server and disconnect the power plug from a power outlet before cleaning or installing/removing internal optional devices. Touching any internal device of the server with its power cord connected to a power source may cause an electric shock even of the server is off-powered.
Occasionally disconnect the power plug from the outlet and clean the plug with a dry cloth. Heat will be generated if condensation is formed on a dusty plug, which may cause a fire.

⚠ CAUTION

High temperature

Components including internal hard disk drives in the server are extremely hot just after the server is turned off. Allow the surface to cool before installing/removing.

Secure cables or cards in place

Be sure to secure the power cord, interface cables, and cards in place. Incomplete installation causes a loose connection, resulting in smoke or fire

Electric shock

The cooling fans, hard disk drives, and power supply unit (only when two servers are installed) support hot swapping. If replacing a component when the electrical current is being supplied, use extreme caution not to get electric shock by touching terminal parts of the internal components.

During operation

⚠ CAUTION

Do not pull out or remove the server from the rack.

Do not pull the server out of the rack or remove it from the rack. In addition to causing equipment to not function properly, separating the server from the rack may result in personal injury.

Avoid contact with the server during thunderstorms.

Do not touch any part of the server including the cables when a thunderstorm is approaching. Also, do not connect or disconnect any devices. There may be a risk of electric shock from lightning strike.

Keep animals away from the server.

Keep animals such as pets away from the server. Pet hair or other waste enters the server, which may cause a fire or electric shock.

Do not leave the optical disk drive tray open.

Dust may get in the server when the tray is open, which may result in a malfunction. In addition, bumping the open tray could cause personal injury.

Do not remove the server from the rack while it is operating.

Do not pull out or remove the server from the rack while the server is running. In addition to causing equipment to not function properly, separating the server from the rack may result in personal injury.

Do not place any object on top of servers.

Separating the server from the rack may result in personal injury and damage to nearby personal belongings.

Do not get yourself caught in the fan

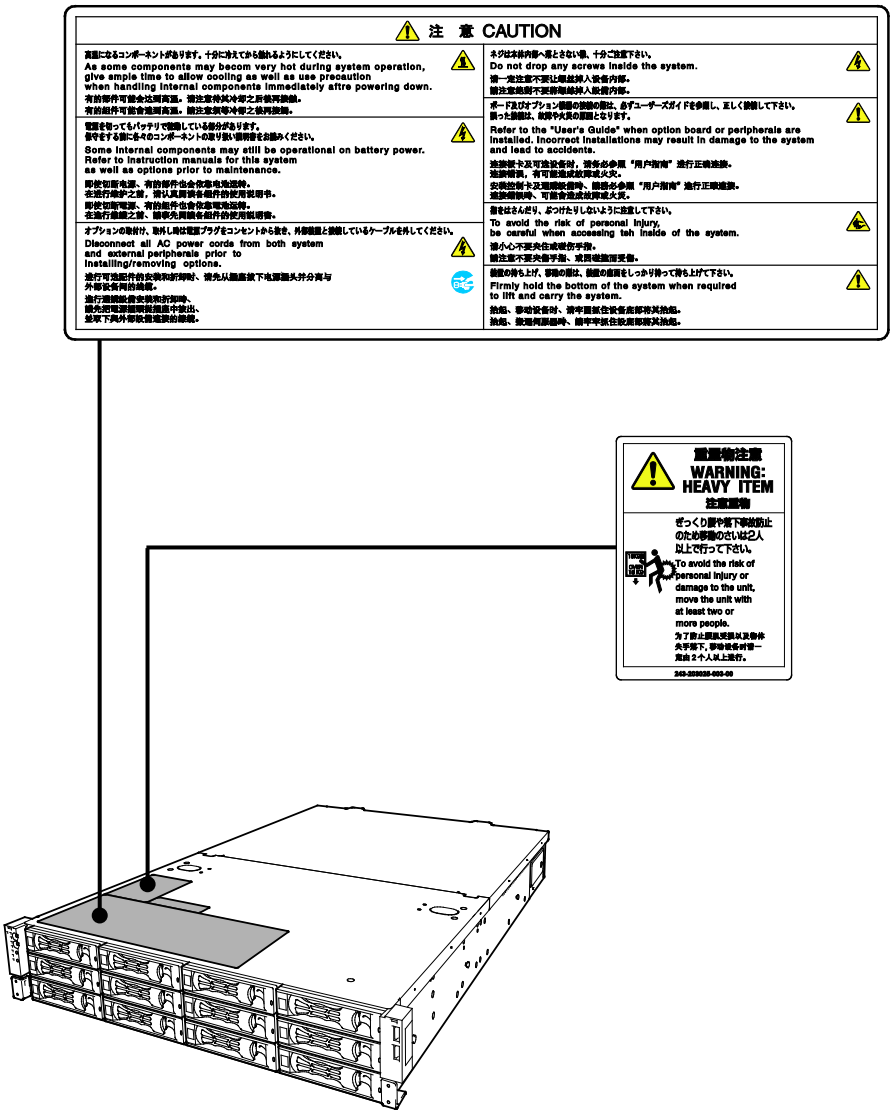
Keep your hands and hair away from the cooling fan at the rear of the server during operation. Failure to observe this warning may cause your hands or hair to catch in the fan, resulting in personal injury.

Warning labels

Warning label are attached on or near the components with potential hazards (This label is either attached or printed on the component.) to draw attention from users to potential hazards involved in handling the server. (Do not remove or black out this label and keep it clean). If no label is attached or printed on the server, or if there is a label coming off or stained, contact the store where you purchased the product.

External view

Ex. Express5800/R120d-2E (3.5-inch hard disk drive model)


注 意 CAUTION
As some components may becom very hot during system operation, give emple time to allow cooling as well as use precaution when handling internal components immediately aftre powering down.
Do not drop any screws inside the system.
Some internal components may still be operational on battery power. Refer to instruction manuals for this system as well as options prior to maintenance.
Refer to the "User's Guide" when option board or peripherals are installed. Incorrect installations may result in damage to the system and lead to accidents.
To avoid the risk of personal injury, be careful when accessing teh inside of the system.
Disconnect all AC power cords from both system and external peripherals prior to installing/removing options.
Firmly hold the bottom of the system when required to lift and carry the system.
重量物注意
WARNING: HEAVY ITEM
注意重物
To avoid the risk of personal injury or damage to the unit, move the unit with at least two or more people.

Handling precautions (for proper operations)

Be sure to observe the following precautions for the proper functioning of the server. Ignoring the precautions may cause server malfunction or failure.

- **To avoid the influence of the electric waves, switch of any cell phone or PHS near the server.**
- **Place the server in an appropriate location. For details, refer to *Chapter 2 Preparations (2. Installation and Connection)*.**
- **Before connecting/removing cables to/from peripheral devices, make sure that the server is off and unplug the power cord.**
- **Connect the provided power cord to a 100/200 VAC outlet.**
- **Make sure that the access LED on the server is off before turning off the power or ejecting an optical disk.**
- **Wait for at least 30 seconds before turning on the server after turning off the server. If any Uninterruptible Power Supply unit is connected, set it to wait for at least 30 seconds before turning on the server after power off.**
- **After connecting power cord to the server, do not press the POWER switch/LED before the POWER LED (amber) is unlit.**
- **Turn off the server and unplug the power cord before moving it.**
- **Regularly clean the server to prevent various types of failure. (Refer to *Chapter 1 Maintenance (2. Daily Maintenance)* in "*Maintenance Guide*" for details about cleaning.)**
- **Momentary voltage drop may occur due to lightning strike. To prevent this, use of UPS is recommended.**
- **We do not guarantee that any copy-protected CD that does not conform to standards will play on the CD player.**
- **In the following cases, check and adjust the system clock before operation.**
  - After transportation
  - After storage
  - After the server is used following a period of disuse, in which storage conditions did not conform to those that guarantee server operations (temperature: 10°C to 40°C[*1]; humidity: 20% to 80%).
    Check the system clock approximately once per month. Use of a time server (NTP server) is recommended if high accuracy timing is required by the system.
    *1: 10°C to 35°C when three N8103-153 RAID Battery Backup Units are installed.
- **Observe the storage conditions (Temperature: –10°C to 55°C, Humidity: 20% to 80%, No condensation of moisture) to store the server.**
- **If this server, internal optional devices, and media set for the backup devices (tape cartridges) are moved from a cold place to a warm place in a short time, condensation will occur and cause malfunctions and failures when these are used in such state. To protect important stored data and property, make sure to wait for a sufficient period to use the server and components in the operating environment.**
  Reference: Time effective at avoiding condensation in winter (more than 10°C differences between the room temperature and atmospheric temperature)

  Disk devices: Approximately 2 to 3 hours
  Tape media: Approximately 1 day
- **For optional devices, we recommend you use our NEC products. Some memory or hard disk drives manufactured by other companies are supported for use with this server, however, you will be charged to repair failure or damage caused by use of such products even within warranty period.**

Tips for your health and safety

Using a computer extensively may affect different parts of your body. Here are tips you should follow while working on a computer to minimize strain on your body.

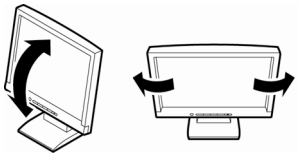
Keep proper posture

The basic body position for using a computer is sitting straight with your hands on the keyboard parallel with the floor, and your eyes directed slightly downward toward the monitor. With the proper posture described above, no unnecessary strain is applied on any part of your body, in other words when your muscles are most relaxed.

Working on the computer with bad posture such as hunching over or being too close to the monitor could cause fatigue or deteriorated eyesight.

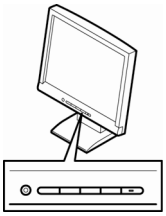
Adjust the angle of your display

Most display units are designed for adjustment of the horizontal and vertical angles. This adjustment is important to prevent the screen from reflecting bright lights and to make the display contents easy to see. Working without adjusting the display to a comfortable angle makes it difficult for you to maintain a proper posture and you will get tired easily. Adjust the viewing angle before use.



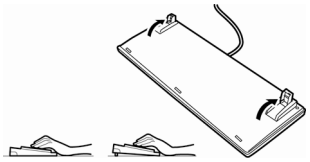
Adjust the brightness and contrast of the display

Display screens have functions to control brightness and contrast. The most suitable brightness/contrast depends on age, individuals, and environment, so adjust it to suit your preferences. A too bright or too dark display is bad for your eyes.



Adjust the angle of keyboard

Some keyboards are ergonomically designed, which allow the angle to be adjusted. Adjusting the angle of the keyboard is effective to reduce tension on your shoulders, arms, and fingers.



Clean your equipment

Keeping your equipment clean is important not only for the appearance but also for functional and safety reasons. A dusty monitor makes it difficult to see the display contents, so clean it regularly.

Take rest breaks

When you feel tired, take a break. Light exercise is also recommended.

NEC Express5800 Series
Express5800/R120d-2E

1

General Description

This chapter introduces the features of this server and the name of each part.

1. **Introduction**

2. **Accessories**
   Verify the condition of your server's accessories.

3. **Standard Features**
   Check and maintain the server system by using the functions explained in this section.

4. **Names and Functions of Parts**
   This section describes the name of each part contained in this server.

1. Introduction

Thank you for purchasing this NEC Express5800 Series product.

This high performance server is powered by the latest microprocessor "Intel® Xeon® processor.

NEC's latest technology and architectures realize high-power and high-speed operation that cannot be matched by existing servers.

The server is designed with consideration of not only reliability but also expandability, which enables you to use it as a network server.

Read this document before using the server thoroughly to fully understand handling of Express5800 Series Server and appreciate its functions to the maximum extent.

2. Accessories

The carton box contains various accessories which are required for setup or maintenance. **Make sure you have them all** for future use.

- **Front bezel (Option of R120d-2E)**
- **Bezel Lock Key (attached to the Front Bezel option of R120d-2E)**
- **EXPRESSBUILDER*1**
- **SAS/SATA cable (2.5-inch Hot Plug Drive HDD Cage or RAID controller is unmounted)**
- **Getting Started**
- **Use notes (Traditional Chinese version)**

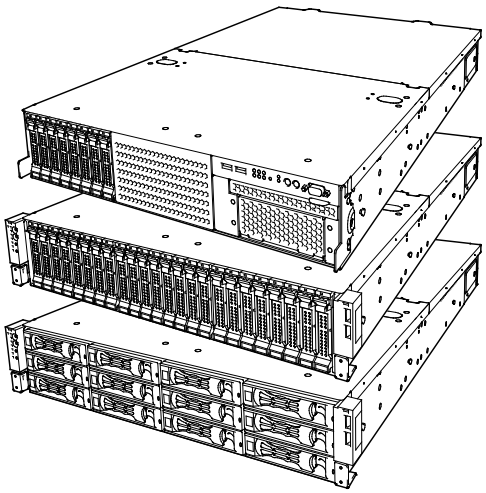
*1 Documents are stored in EXPRESSBUILDER. Adobe Reader is required to read the documents so make sure you have it installed in your PC.

Make sure you have all accessories and inspect them. If an accessory is missing or damaged, contact your sales representative.

Important **The chassis serial number plate and maintenance label is located on the server. If the serial number does not match the number on the warranty, you may not be guaranteed against failure even within the warranty period. Contact your sales representative if they do not match.**

3. Standard Features

The server has the following standard features:



High performance

- Intel® Xeon® processor
  - – N8100-1950F
  - – N8100-1951F
  - – N8100-1952F
  - – N8100-1953F
- Turbo Boost feature
- Hyper Threading feature *1
- High-speed memory access (DDR3L 1600 supported)*2
- High-speed disk access (SATA3/SAS 6 Gbps supported)
- High-speed 1000BASE-T/100BASE-TX/10BASE-T (4 ports) interface (1Gbps/100Mbps/10Mbps supported)

High reliability

- Processor throttle-ring feature
- Memory monitoring feature (error correction/error detection)
- Memory degeneracy feature (logical isolation of a failed device)
- Memory throttle-ring feature
- Memory Independent / Lockstep / Mirroring / Sparing mode
- Bus parity error detection
- Temperature detection
- Error detection
- Internal fan monitoring feature
- Internal voltage monitoring feature
- RAID system (disk array) (option card required)
- Auto rebuild function (hot swapping supported)
- BIOS password feature
- The security lock that comes with the front bezel (Option of R120d-2E)

Management Utilities

- NEC ESMPRO
- ExpressUpdate
- Remote controlling feature (EXPRESSSCOPE Engine 3)
- RAID system management utility (Universal RAID Utility)
- Hard disk drive monitoring
- Power monitoring feature

Power saving and noiseless design

- Can select the best power supply unit according to system environment / load / configuration. (26x 2.5-inch drive model and 3.5-inch drive model support power supply of 800 W only.)
- Power monitoring feature
- Power control feature
- 80 PLUS® Platinum certified high efficiency power supply
- Fan control appropriate to environment, work load, and configuration
- Silent sound design
- Enhanced Intel SpeedStep® Technology supported

Expandability

- PCI Express 3.0 (x8 lanes): 1 slot (Full Height)
- PCI Express 3.0 (x4 lanes): 2 slots (low profile)
- PCI Express 2.0 (x4 lanes): 1 slot (low profile)
- PCI Express 2.0 (x1 lanes): 1 slot (low profile)
- PCI Express 3.0 (x8 lanes): 1 slot (dedicated to RAID Controller)
- Large capacity memory of up to 384 GB *3
- Can upgrade to multi-processor system with up to two processors
- Hard disk drive bays
  – 16x 2.5-inch drive model: 2.5-inch drive bay 16 slots *4
  – 26x 2.5-inch drive model: 2.5-inch drive bay 26 slots *5
  – 3.5-inch drive model: 3.5-inch drive bay 12 slots , 2.5-inch drive bay: 2 slots *6
- Optical disk drive bay provided as standard (16x 2.5-inch drive model)
- Back up device bay provided as standard (16cx 2.5-inch drive model)
- USB2.0 interface
- Five LAN ports (one for management LAN)

Ready to use

- No cable connection is required to install a hard disk drive and additional power supply unit (hot swap supported).
- Sliding rails that allows easy installation.

Many built-in Features

- Redundant power supply system supported (valid when optional power supply unit is installed)
- El Torito Bootable CD-ROM (no emulation mode) format supported
- Software power-off
- Remote power-on feature
- AC-Link feature
- Remote console feature
- Power switch mask
- Baseboard Management Controller (BMC) conforming to IPMI v2.0

Self-diagnosis

- Power On Self-Test (POST)
- Test and Diagnosis (T&D) utility

Easy setup

- EXPRESSBUILDER (setup utility)
- SETUP (BIOS setup utility)

Maintenance features

- Off-line Tools
- Memory dump feature using the DUMP switch
- Feature to back up and restore BIOS/BMC settings using the EXPRESSSCOPE profile key

*1: May not be supported depending on the installed processor type.

*2: Processor core speed depends on the number and type of CPU and DIMMs installed, and operating voltage (1.35/1.5 V).

*3: In 2-CPU configuration. Up to 192 GB in 1-CPU configuration

*4: With N8154-46 2.5-inch HDD cage installed. 8 slots for 2.5-inch hard disk drive in standard configuration.

*5: With N8154-47 2.5-inch HDD cage (rear) installed. 24 slots for 2.5-inch hard disk drive bay in standard configuration.

*6: With N8154-47 2.5-inch HDD cage (rear) installed. 12 slots for 3.5-inch hard disk drive bay in standard configuration.

3.1 Management Features

The hardware components of the server provide operation control/reliability features as shown below. Additionally, *NEC ESMPRO Agent*, which is provided in EXPRESSBUILDER, enables you to collectively manage the state of your systems. You can also monitor the server states from a PC to manage the network where *NEC ESMPRO Manager* provided in EXPRESSBUILDER is installed.

The features available on this server are as shown in the table below.

Function		Availability	Description
Hardware			Shows physical hardware information.
	Memory bank	○	Shows physical memory information.
	Device info	○	Shows information specific to the server.
	CPU	○	Shows physical CPU information.
System		○	Shows logical CPU information and monitors the load factor. Shows logical memory information and monitors the status.
I/O device		○	Shows information on I/O devices (serial ports, keyboard, mouse, and video).
System environment			Monitors temperatures, fans, voltage, power supply, and others.
	Temperature	○	Monitors the temperature inside of the chassis.
	Fan	○	Monitors the fans.
	Voltage	○	Monitors the voltage inside of the chassis.
	Power supply	○	Monitors the power supply unit.
Software		○	Shows service, driver, and OS information.
Network		○	Shows network (LAN) information and monitors packets.
BIOS		○	Shows BIOS information.
Local polling		○	Monitors the values of MIB items obtained by NEC ESMPRO Agent.
Storage		○	Monitors controllers and storage devices including hard disk drives.
File system		○	Shows the file system configuration and monitors the free space.
RAID System		○	Monitors the following RAID Controllers: • Optional RAID Controller (N8103-149/150/151/160)
Others*		○	Monitors OS stall using the Watch Dog Timer.
		○	Performs alert processing after an OS STOP error occurs.

○: Supported. △: Partially supported. ×: Unsupported.

*: Not displayed on the NEC ESMPRO Manager screen.

Tips NEC ESMPRO Manager and NEC ESMPRO Agent are supplied with the server as standard. For how to install and use each software component, refer to the explanation of the component.

3.2 Firmware and Software Version Management

Use of NEC ESMPRO Manager and ExpressUpdate Agent allows you to manage versions of firmware and software as well as update them by applying update packages.

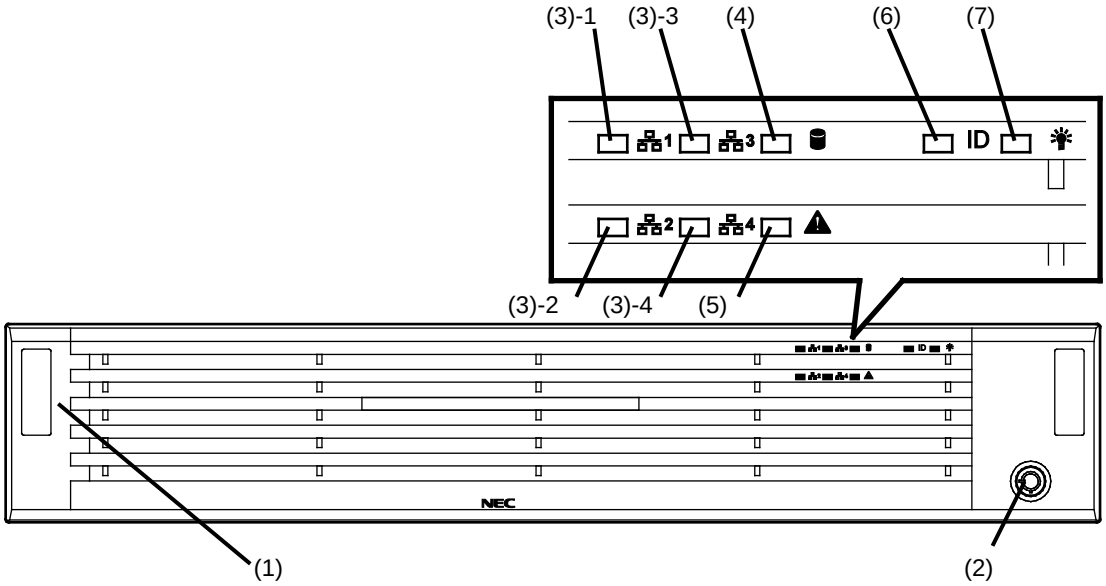
This function automatically updates multiple modules without stopping the system just by specifying the application of an update package from NEC ESMPRO Manager.

4. Names and Functions of Parts

This section describes the names of the server parts.

4.1 Front View (Front Bezel option: N8146-26F)

16x 2.5-inch drive model



(1) Front Bezel

The cover to protect the front of the server. This cover can be locked with the provided Bezel Lock Key.

(2) Key slot

The key slot for Bezel Lock Key that is used to lock Front Bezel.

(3) LINK/ACT LED (green)

This LED turns on when the server is connected to the network.

Sequential numbers *1* ,2,3 and 4 indicate LAN connectors 1,2,3 and 4, respectively.

(4) Disk Access LED (green/amber)

This LED lights green when the internal hard disk drive is being accessed.

An amber light turns on if a hard disk drive is broken, and a light flashes green and amber alternately when a hard disk drive is being rebuilt. (RAID System only)

(5) STATUS LED (green/amber)

This LED indicates the server status. It lights green when the server is operating normally. If a failure is detected, it turns on or flashes amber.

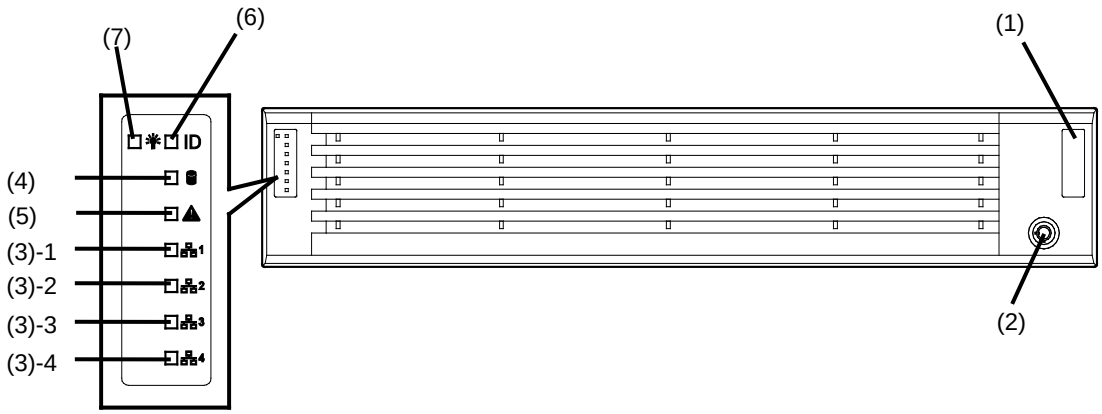
(6) Unit ID (UID) LED (blue)

This LED turns on when the UID switch is pressed. Commands from the software also cause it to turn on or flash.

(7) POWER LED (green)

This LED lights green when the power is ON.

26x 2.5-inch drive model



(1) Front Bezel
The cover to protect the front of the server. This cover can be locked with the provided Bezel Lock Key.

(2) Key slot
The key slot for Bezel Lock Key that is used to lock Front Bezel.

(3) LINK/ACT LED (green)
This LED turns on when the server is connected to the network.
Sequential numbers *1* ,2,3 and 4 indicate LAN connectors 1,2,3 and 4, respectively.

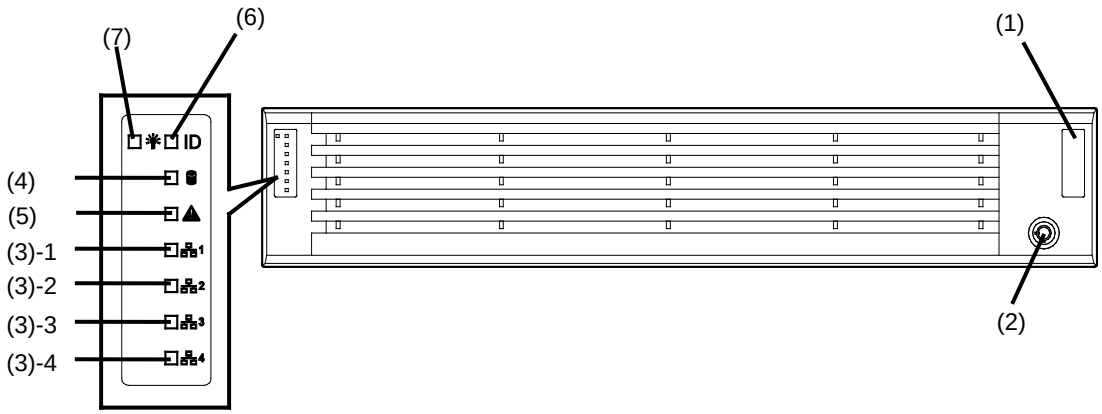
(4) Disk Access LED (green/amber)
This LED lights green when the internal hard disk drive is being accessed.
An amber light turns on if a hard disk drive is broken, and a light flashes green and amber alternately when a hard disk drive is being rebuilt. (RAID System only)

(5) STATUS LED (green/amber)
This LED indicates the server status. It lights green when the server is operating normally. If a failure is detected, it turns on or flashes amber.

(6) Unit ID (UID) LED (blue)
This LED turns on when the UID switch is pressed. Commands from the software also cause it to turn on or flash.

(7) POWER LED (green)
This LED lights green when the power is ON.

3.5-inch drive model



(1) Front Bezel
The cover to protect the front of the server. This cover can be locked with the provided Bezel Lock Key.

(2) Key slot
The key slot for Bezel Lock Key that is used to lock Front Bezel.

(3) LINK/ACT LED (green)
This LED turns on when the server is connected to the network.
Sequential numbers *1* ,2,3 and 4 indicate LAN connectors 1,2,3 and 4, respectively.

(4) Disk Access LED (green/amber)
This LED lights green when the internal hard disk drive is being accessed.
An amber light turns on if a hard disk drive is broken, and a light flashes green and amber alternately when a hard disk drive is being rebuilt. (RAID System only)

(5) STATUS LED (green/amber)
This LED indicates the server status. It lights green when the server is operating normally. If a failure is detected, it turns on or flashes amber.

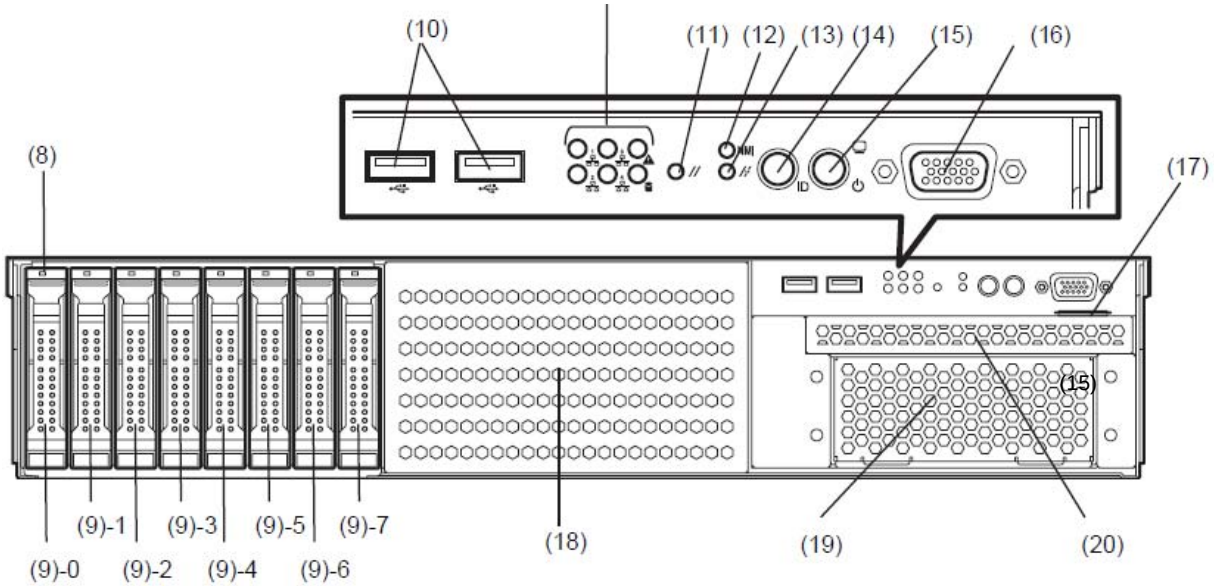
(6) Unit ID (UID) LED (blue)
This LED turns on when the UID switch is pressed. Commands from the software also cause it to turn on or flash.

(7) POWER LED (green)
This LED lights green when the power is ON.

4.2 Front View (with the Front Bezel Removed)

16x 2.5-inch drive model

See (3) to (5) on previous page.



(8) DISK LED (green/amber)
The LED provided for each hard disk drive
This LED light turns green when a hard disk drive is being accessed. The light turns amber if a hard disk drive is broken and it flashes green and amber alternately when a hard disk drive is being rebuilt. (Only applied to RAID System)

(9) 2.5-inch Drive Bay
The bay where hard disk drives are installed. The sequential numbers indicate the corresponding port numbers. All bays include dummy trays.

(10) USB connectors (front)
These connectors are used to connect devices that support the USB interface.

(11) BMC RESET Switch
The switch to reset BMC of this server. Use the switch only when there is something wrong with EXPRESSSCOPE Engine 3 (BMC).To use this switch, press it at least five seconds.

(12) Reset Switch
When the Reset switch is pressed, the system is reseted

(13) DUMP Switch (NMI)
When the DUMP switch is pressed, memory dump is performed.

(14) Unit ID (UID) Switch (blue)
The switch to turn on and off the UID LEDs provided at the front and rear of the server. Pressing the switch once turns on the UID LED and pressing once more turns off the LED. Commands from the software also cause it to turn on or flash.

(15) POWER Switch /LED (green/amber)
The switch to turn the server on and off. Press once to turn on the server. The Power LED lights when it is on. Press it again to turn off the server. Hold down the switch for 4 seconds or more to forcibly turn off, the server.

(16) Display connector
Connect a display unit. This connector is exclusively used with the display connector on rear panel.

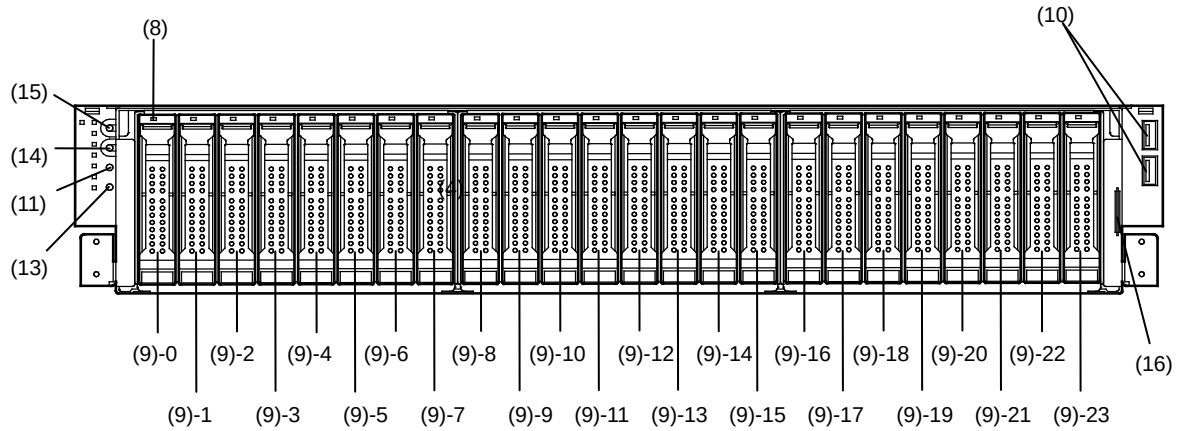
(17) Pull-out Tab
A label indicating the part number and serial number of the server is located on the pull-out tab.

(18) 2.5-inch HDD cage bay
A bay to install N8154-39 2.5-inch HDD cage.

(19) Expansion bay (for backup file device)
A bay to install optional DAT drive or AIT drive.

(20) Optical Disk Drive Bay
The bay where Optical Disk Drive is installed.
Either of the following drive can be installed.
- DVD-ROM drive
- DVD Super MULTI drive

26x 2.5-inch drive model



(8) DISK LED (green/amber)
The LED provided for each hard disk drive
This LED light turns green when a hard disk drive is being accessed. The light turns amber if a hard disk drive is broken and it flashes green and amber alternately when a hard disk drive is being rebuilt. (Only applied to RAID System)

(9) 2.5-inch Drive Bay
The bay where hard disk drives are installed. The sequential numbers indicate the corresponding port numbers. All bays include dummy trays.

(10) USB connectors (front)
These connectors are used to connect devices that support the USB interface.

(11) BMC RESET Switch
The switch to reset BMC of this server. Use the switch only when there is something wrong with EXPRESSSCOPE Engine 3 (BMC).To use this switch, press it at least five seconds.

(12) Reset Switch
When the Reset switch is pressed, the system is reseted

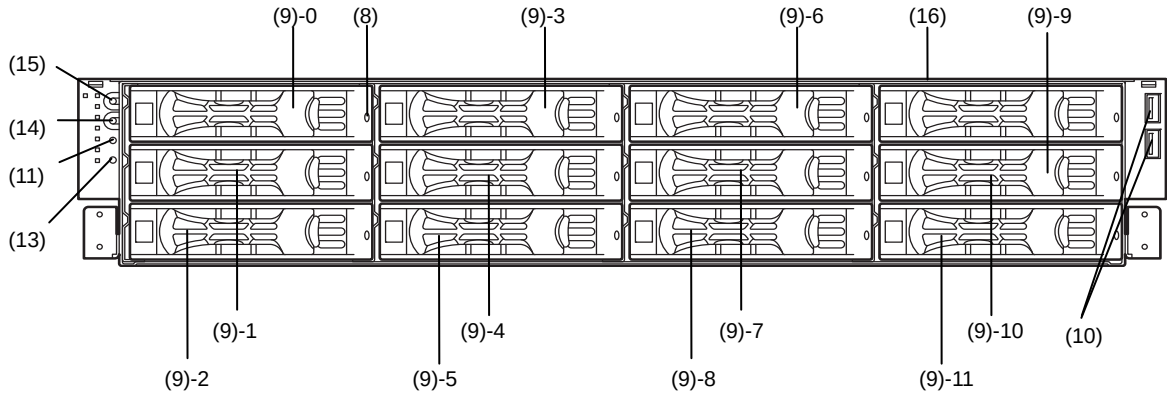
(13) DUMP Switch (NMI)
When the DUMP switch is pressed, memory dump is performed.

(14) Unit ID (UID) Switch (blue)
The switch to turn on and off the UID LEDs provided at the front and rear of the server. Pressing the switch once turns on the UID LED and pressing once more turns off the LED. Commands from the software also cause it to turn on or flash.

(15) POWER Switch /LED (green/amber)
The switch to turn the server on and off. Press once to turn on the server. The Power LED lights when it is on. Press it again to turn off the server. Hold down the switch for 4 seconds or more to forcibly turn off, the server.

(16) Pull-out Tab
A label indicating the part number and serial number of the server is located on the pull-out tab.

3.5-inch drive model



(8) DISK LED (green/amber)
The LED provided for each hard disk drive
This LED light turns green when a hard disk drive is being accessed. The light turns amber if a hard disk drive is broken and it flashes green and amber alternately when a hard disk drive is being rebuilt. (Only applied to RAID System)

(9) 2.5-inch Drive Bay
The bay where hard disk drives are installed. The sequential numbers indicate the corresponding port numbers. All bays include dummy trays.

(10) USB connectors (front)
These connectors are used to connect devices that support the USB interface.

(11) BMC RESET Switch
The switch to reset BMC of this server. Use the switch only when there is something wrong with EXPRESSSCOPE Engine 3 (BMC).To use this switch, press it at least five seconds.

(12) Reset Switch
When the Reset switch is pressed, the system is reseted

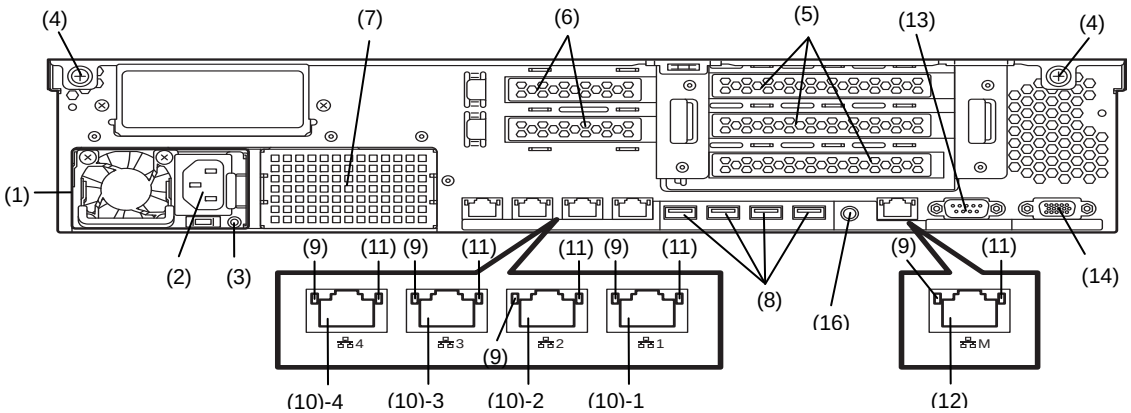
(13) DUMP Switch (NMI)
When the DUMP switch is pressed, memory dump is performed.

(14) Unit ID (UID) Switch (blue)
The switch to turn on and off the UID LEDs provided at the front and rear of the server. Pressing the switch once turns on the UID LED and pressing once more turns off the LED. Commands from the software also cause it to turn on or flash.

(15) POWER Switch /LED (green/amber)
The switch to turn the server on and off. Press once to turn on the server. The Power LED lights when it is on. Press it again to turn off the server. Hold down the switch for 4 seconds or more to forcibly turn off, the server.

(16) Pull-out Tab
A label indicating the part number and serial number of the server is located on the pull-out tab.

4.3 Rear View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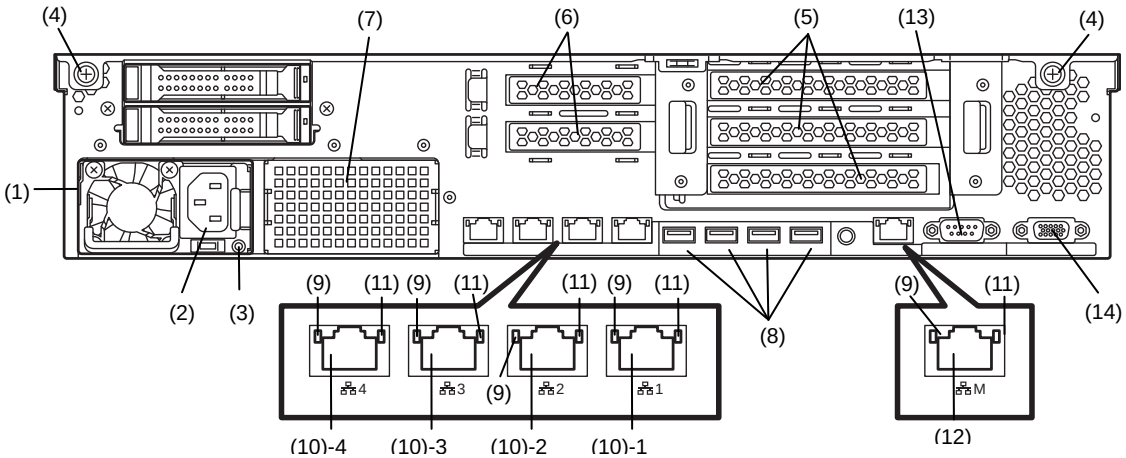
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(12)

(1) Power Unit (Poser Supply Slot)
This unit supply DC power.

(2) AC Inlet
This socket is used to connect the power cord.

(3) AC POWER LED (green/amber)
This LED indicates status of Power unit.

(4) Screw of Top Cover

(5) Slot for full-height PCI board
The slot to install full-height PCI board.
Assigned slot numbers are 1B, 2B, and 3C.

(6) Slot for low-profile PCI board
The slot to install low-profile PCI board.
Assigned slot numbers are 1C and 2C.

(7) Blank cover (for additional power supply unit)
Remove this cover to install an optional power supply unit.

(8) USB connectors
These connectors are used to connect devices that support the USB interface.

(9) LINK/ACT LED (green)
The LED indicates the access status of LAN

(10) LAN connectors
1000BASE-T/100BASE-TX/10BASE-T supported Ethernet connectors
Sequential numbers *1* ,2,3 and 4 indicate LAN connectors 1,2,3 and 4, respectively.

If Shared BMC LAN feature is enabled in ROM Utility, LAN connector 1 can also be used as the management LAN port. However, sharing port is not recommended from the point of performance and security, because LAN port 1 may receive both data.

(11) SPEED LED (green/amber)
The LED indicates the transfer speed of LAN ports

(12) Management LAN Port
Ethernet connector which supports 100BASE-TX/10BASE-T.This port cannot be used as a data transmission port. This port is used for connecting to EXPRESS SCOPR ENGINE 3.

(13) Serial port A (COM A) connector
This connector is used to connect devices that support a serial interface. Note that it is not possible to directly connect to a dedicated line.

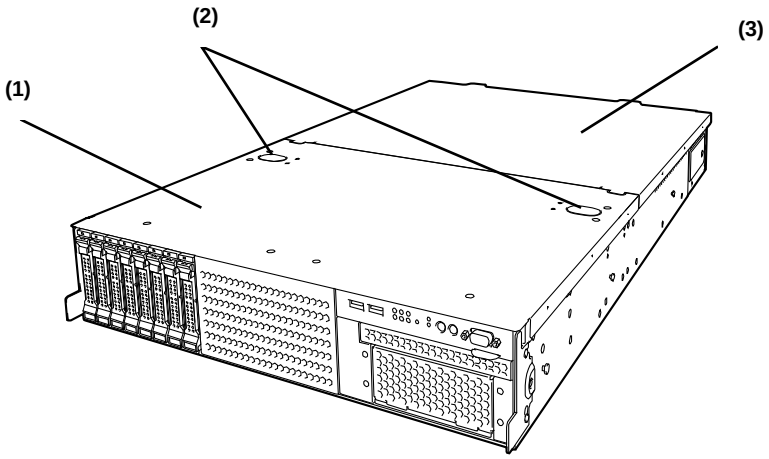
(14) Display connector
The connector to connect the display
This connector is exclusively used with the display connector on front panel.

(15) DUMP Switch (NMI)
When the DUMP switch is pressed, memory dump is performed.

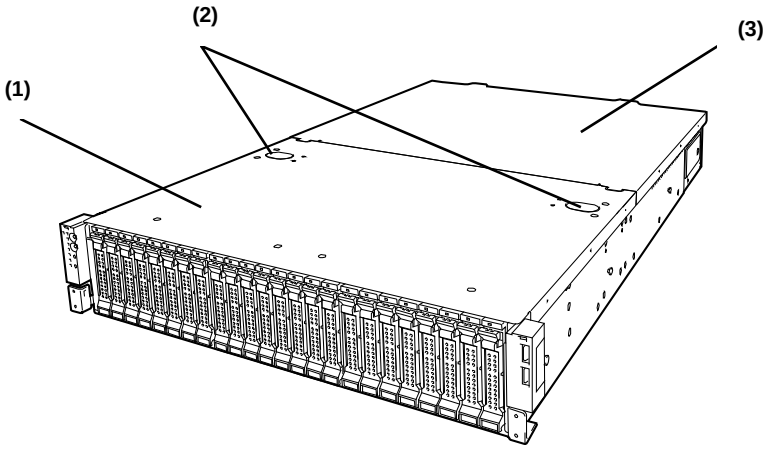
(16) UID (Unit ID) Switch/LED (blue)
The switch to turn on and off the UID LEDs provided at the front and rear of the server. Pressing the switch once turns on the UID LED and pressing once more turns off the LED.

4.4 External View

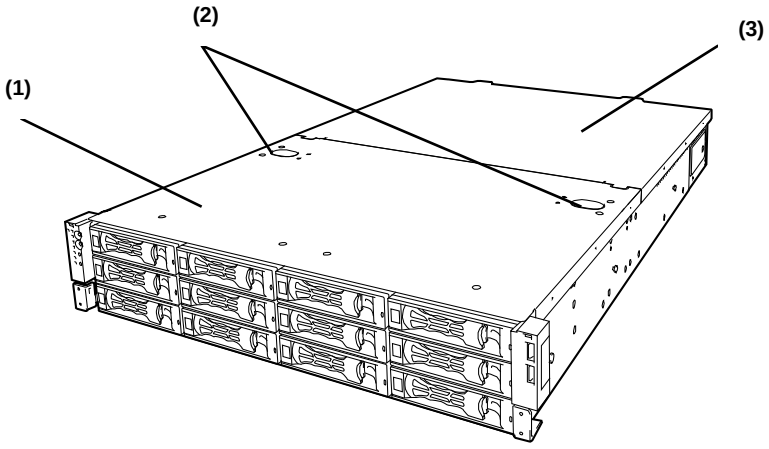
16x 2.5-inch drive model



26x 2.5-inch drive model



3.5-inch drive model

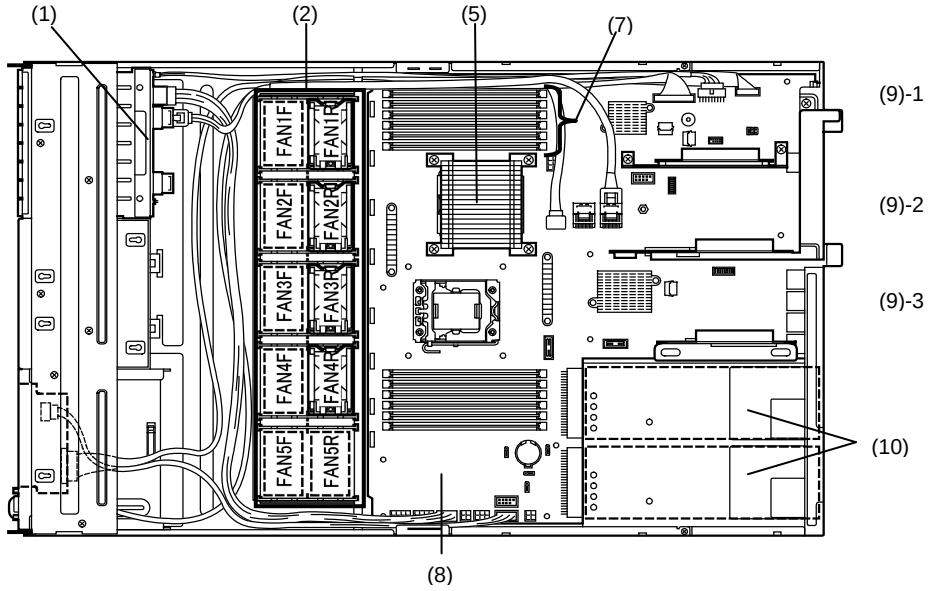


(1) Top Cover (front)
(2) Release Button
(3) Top Cover (rear)

4.5 Internal View

The image below does not show the processor duct.

16x 2.5-inch drive model



(1) Front Panel Board (attached under protect cover)

(2) Protect Cover

(3) Backplane

(4) Cooling fan

-1 FAN1R
-2 FAN2R
-3 FAN3R
-4 FAN4R (Option)
-5 FAN5R
-6 FAN1F (Option)
-7 FAN2F (Option)
-8 FAN3F (Option)
-9 FAN4F (Option)
-10 FAN5F (Option)

FAN1R-3R and 5R are standard parts. FAN4R is option parts when CPU#2 is installed.
FAN1F-5F are option parts when redundant FAN configuration.

(5) Processor (attached under the heat sink)

(7) DIMM (optional)

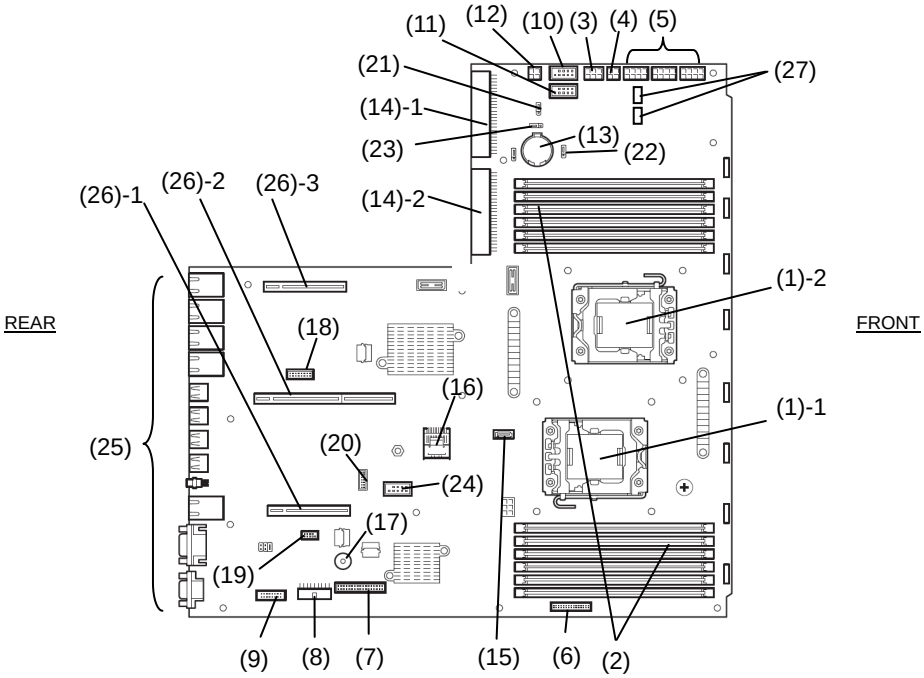
(8) Motherboard

(9) PCI Riser Card

-1 Riser A (RAID Controller Only)
-2 Riser B
-3 Riser C

(10) Power Supply Unit

4.6 Motherboard



(1) Processor (CPU) socket
-1 Processor #1 (CPU#1)
-2 Processor #2 (CPU#2)

(2) DIMM slots

(3) FAN Board power connector

(4) SATA Optical Disk Drive power connector

(5) HDD BP power connector

(6) FAN Board Signal connector

(7) Front Panel connector

(8) Front VGA connector

(9) HDD BP Signal connector

(10) USB connector (front)

(11) USB memory module / USB Back Up Device connector

(12) Rear HDD Cage Power connector

(13) Lithium battery

(14) PSU connector
-1 default (POW #1)
-2 redundant (POW #2)

(15) SATA Optical Disk Drive signal connector

(16) SATA connector

(17) Buzzer

(18) COM connector (for Option N8117-01A)
COM port B when N8117-01A is used.

(19) EXPRESSSCOPE Profile Key connector
EXPRESSSCOPE Profile Key has been installed, where BIOS and BMC configuration data is stored. Move it when replacing MB to keep using the data.

(20) TPM Kit connector

(21) Clear Password Jumper

(22) RAID Configuration Jumper

(23) Clear CMOS Jumper

(24) EXPRESSBUILDER Kit connector

(25) External connector

(26) PCI Riser connector
-1 Riser A
-2 Riser B
-3 Riser C

(27) FAN connector (Rear)
-1 FAN6R
-2 FAN7R

4.7 Status Indicators

This section explains the indication and meanings of the server LEDs.

4.7.1 POWER LED ( )

POWER LED lights green when the server is on. The light turns off when power is not being supplied to the server. The POWER LED lights amber until the server becomes ready to power on after power cord is connected to the server.

POWER LED pattern	Explanation
On (green)	The server is on normally.
On (amber)	BMC is being initialized. When the power cord is connected, the LED goes on amber for 40 seconds. Do not power on the server while the LED is lit amber.
Off	The server is off-powered. The server is in halt status.

4.7.2 STATUS LED (⚠)

While hardware is operating normally, STATUS LED lights green. STATUS LED is off or lights/flashes amber if there is a problem with hardware.

The following table lists STATUS LED patterns, their explanation and solution.

Tips You can reference error logs to check the causes of failures by using NEC ESMPRO.

STATUS LED pattern	Explanation	Solution
On (green)	Normal state	–
Flashing (green)	Memory is in a degraded state	Identify the device in degraded state by using the BIOS setup utility *SETUP*, and replace it as soon as possible.
	An uncorrectable memory error has often occurred.	
	Operating while CPU error is detected	
	In redundant power configuration, power is not supplied to either of power unit.	
Off	The power is off.	Turn on the server.
	POST is in progress.	Wait for a while. STATUS LED will turn green after POST completes.
	Watchdog timer expired.	Turn the power off and then turn it on. If the POST screen displays any error message, take notes of the message, and contact your sales representative.
	An uncorrectable error in memory is detected.	
	Memory dump is being requested. (e.g. when DUMP switch NMI is pressed) Note: It remains green if the dump is caused by software.	Wait until the memory dump is completed.

STATUS LED pattern	Explanation	Solution
On (amber)	A temperature alarm was detected.	Check the internal fan for dusts. Also check if the fan unit is properly connected. If the LED indication does not change when the fans are normal, contact your sales representative.
	A CPU error occurred.	Turn the power off and then turn it on. If the POST screen displays any error message, take notes of the message, and contact your sales representative.
	Abnormal CPU temperature is detected.	
	A PCI system error occurred	
	A PCI parity error occurred	
	A PCI bus error occurred.	
	A voltage alarm was detected.	Contact your sales representative.
	Fan error was detected.	
	Sensor error was detected.	
	A CPU temperature alarm was detected.	
	SMI timeout is detected	
	An error occurred on Node Manager.	
Flashing (amber)	The power supply unit is broken.	Connect the power cord to supply power. If the power supply unit is faulty, contact your sales representative.
	A fan alarm was detected.	Check if the internal fan cable is properly connected. If the LED indication does not change when the fans are normal, contact your sales representative.
	A temperature warning was detected.	Check the internal fan for dusts. Also check if the fan unit is properly connected. If the LED indication does not change when the fans are normal, contact your sales representative.
	A voltage warning was detected	Contact your sales representative.
	One or more hard disk drives are broken.	

4.7.3 LINK/ACT LED (🖧1, 🖧2, 🖧3, 🖧4)

The LED lights green when it is connecting to LAN and flashes when transmitting or receiving data on LAN. The number next to the icon indicates a network port number.

LINK/ACT LED pattern	Explanation
On (green)	The server and hub are powered and properly connected
Flashing (green)	The network port is transmitting or receiving data.
Off	Check the cable or connection

4.7.4 Disk Access LED ( )

DISK Access LED on a hard disk drive to be installed in the drive bay indicates different states.

DISK Access LED pattern	Explanation
On(green)	This indicates a hard disk drive is being accessed
On (amber)	This indicates a hard disk drive is failing.
Flashing (green and amber alternately)	This indicates that a hard disk drive is being rebuilt.
Off	Hard disk drive is halted.

Important

Observe the following precautions whenever you use the auto rebuild feature.

- **Do not turn off or reboot the server while a hard disk drive is being rebuilt.**
- **Wait at least 90 seconds before installing a hard disk drive after removing one.**
- **Do not replace a hard disk drive while another hard disk drive is being rebuilt.**

4.7.5 Optical disk access LED

The access LED for optical disk drive at the front of the server flashes when a CD or DVD is being accessed.

4.7.6 UID LED (ID)

The UID LED is provided one each at the front and rear of the server. If you press the UID switch provided at the front or rear of the server, the light turns on. If you press it again, the light turns off. It flashes when commands from software are received. This LED is used to identify the target server among multiple servers installed in a rack. Especially when performing maintenance from behind the server, lighting the LED will help you to identify which server to work with.

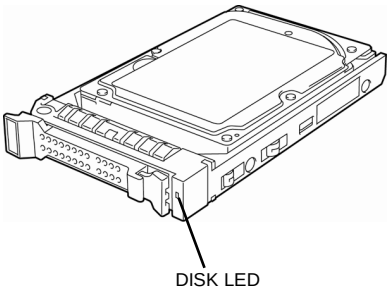
UID LED pattern	Explanation
On (blue)	The UID switch is pressed (ON).
Off	The UID switch is not pressed (OFF).

Tips

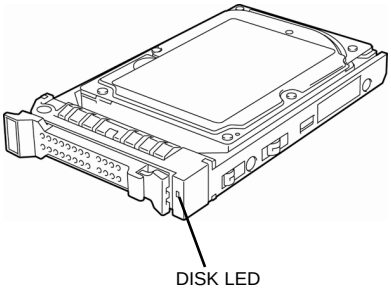
You can turn on an LED using remote management software.

4.7.7 LED on a hard disk drive

DISK LED on a hard disk drive to be installed in the drive bay indicates different states



3.5-inch hard disk drive



2.5-inch hard disk drive

DISK Access LED pattern	Explanation
On(green)	This indicates a hard disk drive is being accessed
On (amber)	This indicates a hard disk drive is failing.
Flashing (green and amber alternately)	This indicates that a hard disk drive is being rebuilt (not a defect). In a RAID system, the hard disk drive is automatically rebuilt upon replacing a failed hard disk drive (auto rebuild feature).
Off	Hard disk drive is halted.

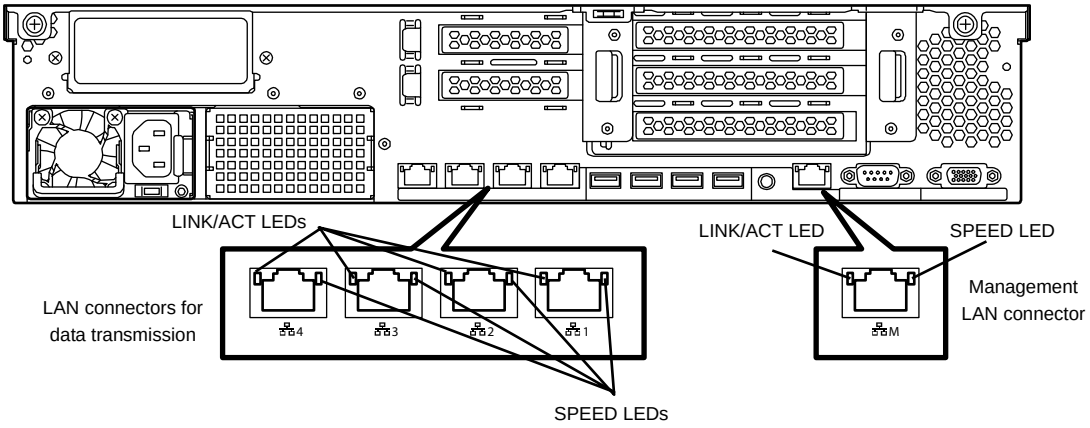
Important

Observe the following precautions whenever you use the auto rebuild feature.

- **Do not turn off or reboot the server while a hard disk drive is being rebuilt.**
- **Wait at least 90 seconds before installing a hard disk drive after removing one.**
- **Do not replace a hard disk drive while another hard disk drive is being rebuilt.**

4.7.8 LEDs for LAN connectors

The five LAN connectors provided at the rear of the server have two LEDs each.



- **LINK/ACT LED (1, 2, 3, 4, M)**

  This LED indicates the state of the standard network port. LINK LED lights green when the server and hub are powered and properly connected. ACT LED flashes green when the network port is transmitting or receiving data.

  If the LED does not turn on in LINK state,

LINK/ACT LED pattern	Explanation
On (green)	The server and hub are powered and properly connected
Flashing (green)	The network port is transmitting or receiving data.
Off	Check the cable or connection

- **SPEED LED (1, 2, 3, 4, M)**

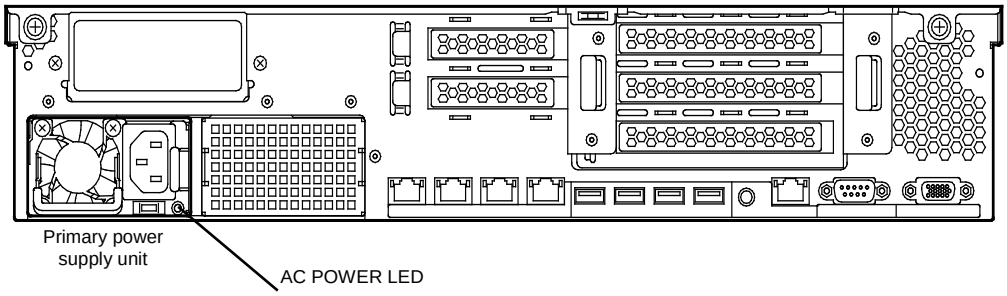
  This LED indicates which network interface is used.

  The four LAN connectors for data transmission support 1000BASE-T, 100BASE-TX, and 10BASE-T.

  Management LAN port supports 100BASE-TX and 10BASE-T.

SPEED LED pattern	Explanation
On (amber)	Operating with 1000BASE-T
On (green)	Operating with 100BASE-TX
Off	Operating with 10BASE-T

4.7.9 AC POWER LED on Power Supply Unit



AC POWER LED pattern	Explanation
On (green)	The server is powered on.
Flashing (green)	The power cable is connected and AC power is supplied.
	Cold Redundant feature is enabled.
On (amber)	The power cable is not connected in redundant power configuration.
	Power supply unit is failing.
Flashing (amber)	Power supply unit is failing.

NEC Express5800 Series
Express5800/R120d-2E

2 Preparations

This chapter describes preparations for using this server.

1. **Installing Internal Optional Devices**

   You can skip this section if you did not purchase any optional devices.

2. **Installation and Connection**

   You must place the server in an ideal location and connect some cables following this section.

1. Installing Internal Optional Devices

This section describes the instructions for installing supported optional devices and precautions. If you did not purchase any optional device requiring installation, you may skip this section.

Important

- **We recommend that optional devices be installed by a maintenance service staff from your maintenance service company, who has specialized knowledge of this server.**
- **Use only the devices and cables specified by NEC. You will be charged to repair damages, malfunctions, and failures caused by the use of any devices or cables not specified for use with this server even within the warranty period.**

1.1 Safety Precautions

Be sure to observe the following precautions to install and remove optional devices properly and safely.

WARNING

Be sure to observe the following precautions to use the server safety. Failure to observe the precautions may cause death or serious injury. For details, refer to *Safety precautions* in *Precautions for Use*.

- **Do not disassemble, repair, or modify the server.**
- **Do not remove the lithium battery, NiMH battery, or Li-ion battery.**
- **Disconnect the power plug when installing and removing devices.**

CAUTION

Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to *Safety precautions* in *Precautions for Use.*

- **Do not drop**
- **Do not leave the server being pulled out.**
- **Make sure to complete installation.**
- **Do not install with the cover removed.**
- **Do not get your fingers caught.**
- **High temperature**
- **Electrical shock**

1.2 Anti-static Measures

The server contains electronic components sensitive to static electricity. Avoid failures caused by static electricity when installing or removing any optional devices.

Wear a wrist strap (an arm belt or anti-static glove)

Wear a wrist strap on your wrist. If no wrist strap is available, touch an unpainted metal part of the cabinet before touching a component to discharge static electricity from your body.

Also discharge static electricity by periodically touching a metal surface while working on the components.

Select a suitable work space

- Work with the server on the anti-static or concrete floor.
- When you work with the server on a carpet where static electricity is likely to be generated, be sure to take anti-static measures beforehand.

Use a work table

Place the server on an anti-static mat to work with.

Clothing

- Do not wear wool or synthetic clothes.
- Wear anti-static shoes.
- Take off any jewels (a ring, bracelet, or wrist watch) before working with the server.

Handling of components

- Keep any component in an anti-static bag until you actually install it to the server.
- Hold any component by its edge to avoid touching any terminals or parts.
- To store or carry any component, place it in an anti-static bag.

1.3 Overview of Installation and Removal

Install/remove components by using the following procedure.

Installing/removing internal components except for Hard Disk Drives should be done after dismounting the server from the rack. It is recommended that more than one person removes the server from the rack.

CAUTION

Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to *Safety precautions* in *Precautions for Use.*

- **Do not drop the server**
- **Do not leave the server pulled out of the rack**
- **Replace the cover after installing components**
- **Beware of high temperatures**
- **Do not get your fingers caught when installing components**

1. If the server is mounted on a rack, use the UID switch to identify the target server.

   Refer to *Chapter 2 (1.4 Confirming Servers (UID Switch))*.

2. Remove the front bezel if applicable.

   Refer to *Chapter 2 (1.5 Removing the Front Bezel)*.

3. If the server is ON, turn it off.

   Refer to *Chapter 3 (6. Turning Off the Server)*.

4. Disconnect the power cord from the outlet and the server.

   Important **After disconnecting the power cord from the server, wait for at least 5 seconds before continuing to work because the components on the motherboard might still be operating for 3 to 4 seconds even after the power cord was disconnected.**

5. You need to pull out the server from rack when installing or removing the following component:

   Optical disk drive, DIMM, processor, TPM Kit, EXPRESSBUILDER Assemble Kit, additional HDD cage, PCI card, RAID Controller, extra battery for RAID Controller

   Important **Do not leave the server open on the rack.**

   If you are going to install a hard disk drive only, go to step 10.

6. Remove the top cover.
   Refer to *Chapter 2 (1.6 Removing Top Cover*).

7. Depending on the components to be installed or removed, follow the procedure in order.
   Refer to *Chapter 2 (1.7 Internal Flash Memory (N8115-10)*) to (*1.17 Optical Disk Drive*).

8. Attach the top cover.
   Refer to *Chapter 2 (1.19 Installing Top Cover*).

9. Mount the server onto the rack.
   Refer to *Chapter 2 (2.1.2 Installing the server to the rack or removing it from the rack (1) Installation)*.

10. Install Hard Disk Drives.
    Refer to *Chapter 2 (1.20 2.5-inch Hard Disk Drive)*.

11. Install Power Supply Unit
    Refer to *Chapter 2 (1.22 Power Supply Unit*).

12. Attach the front bezel.
    Refer to *Chapter 2 (1.5 Removing the Front Bezel*).

This is the end of the installation or removal procedures for internal optional devices.

Continue the setup with reference to *Chapter 2 (2.2 Connection)*.

1.4 Confirming Servers (UID Switch)

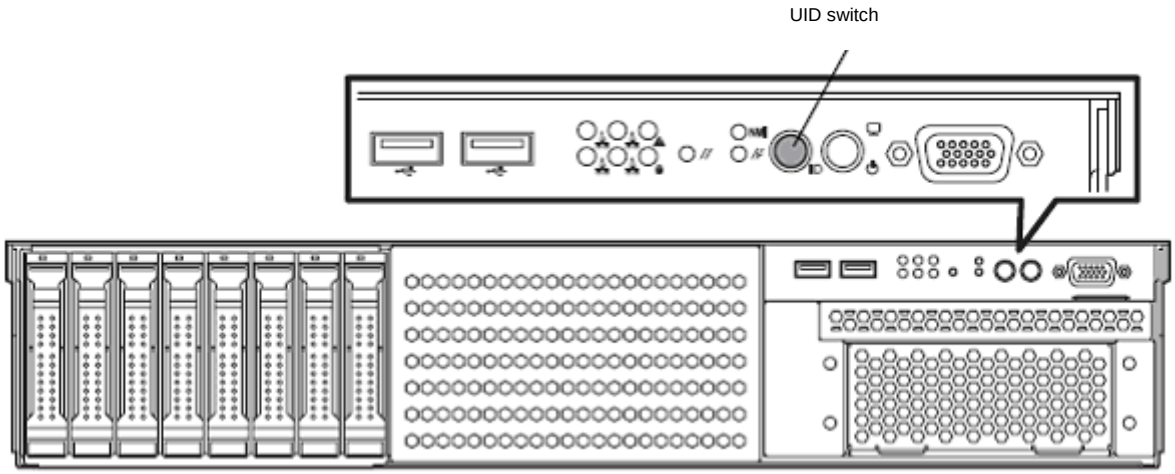
Using the UID switch helps you to identify the target server.

When the server is working or before you turn the server off or disconnect a cable from the server, **be sure to identify the target server by using the UID switch first.**

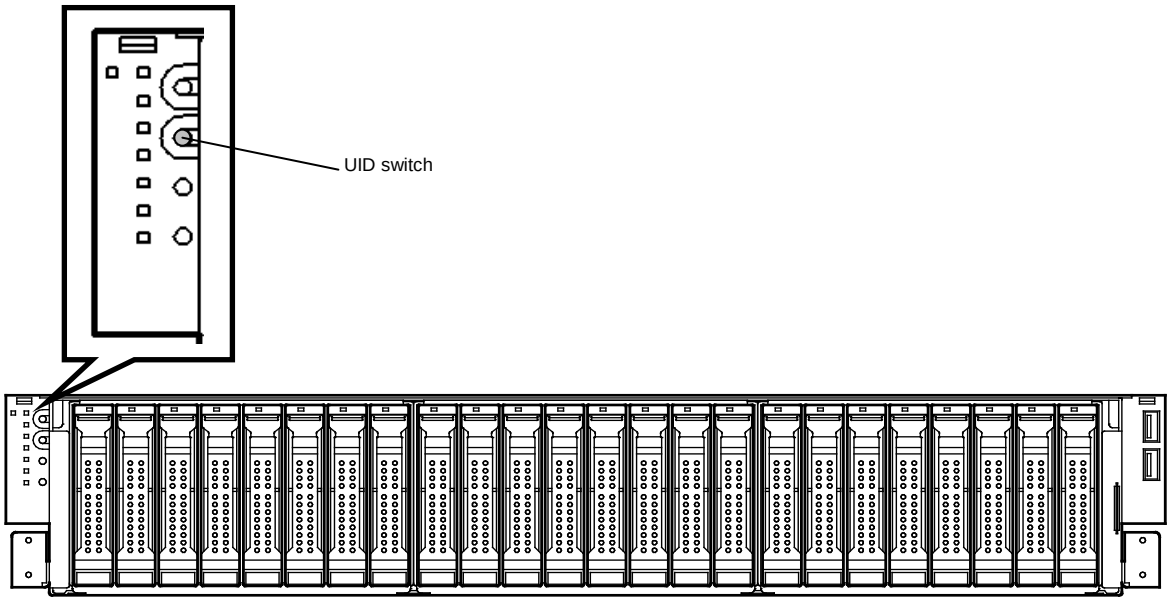
If UID (Unit ID) switch is pressed, UID LED will be on or flash. If it is pressed again, the LED will be off.

<Front View>

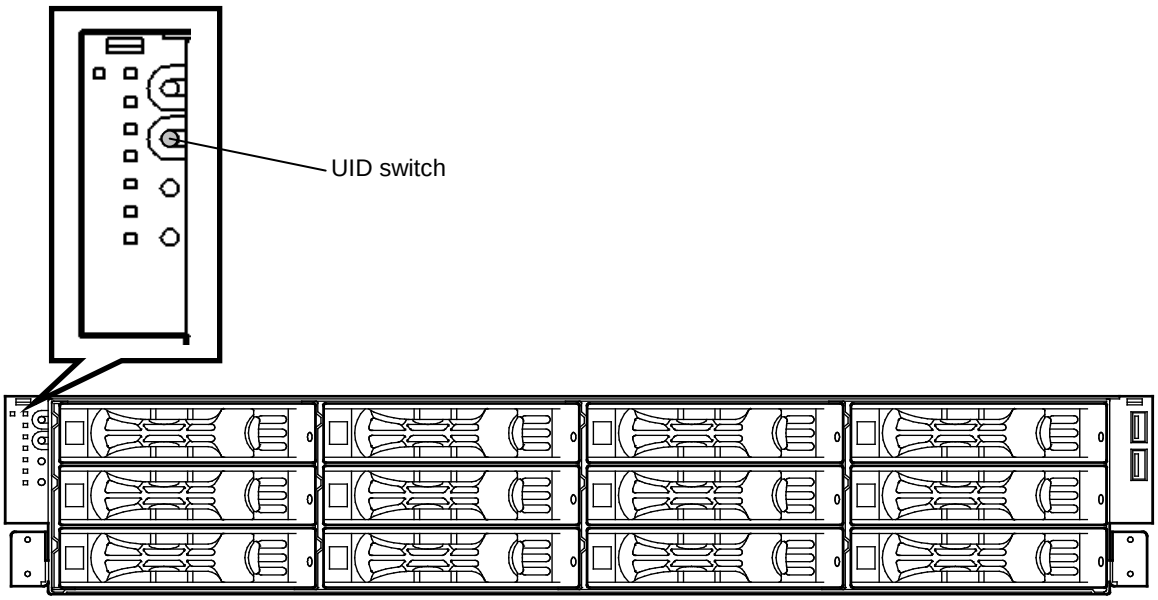
16x 2.5-inchhard disk drive model



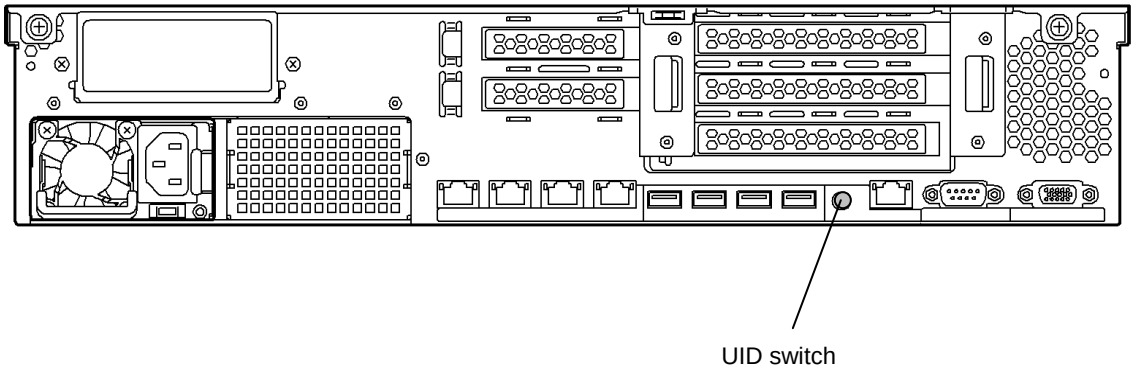
26x 2.5-inch hard disk drive model



3.5-inch hard disk drive model



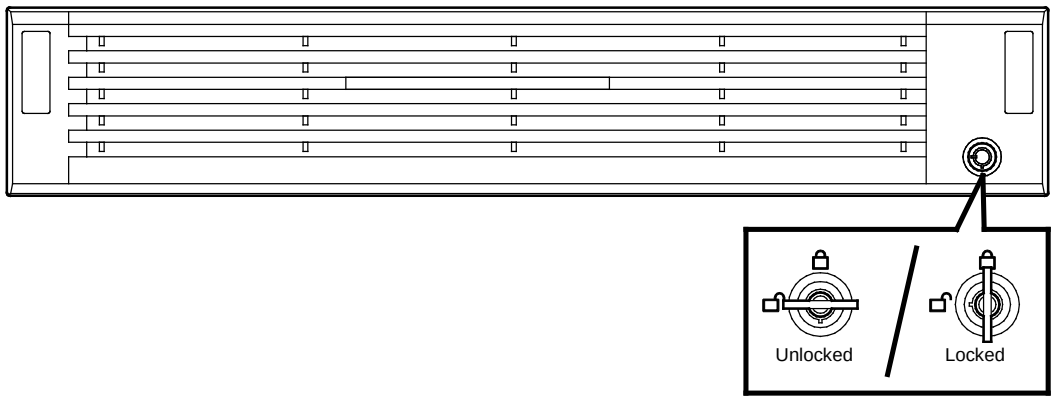
<Rear View>



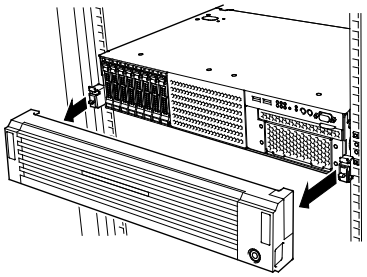
1.5 Removing the Front Bezel

You need to remove the front bezel when manipulating POWER switch or removing the top cover.

1. Insert the attached security key into the key slot and turn the key to the front bezel side while pressing it lightly to release the lock.



2. Hold the both end of the front bezel carefully , pull it toward you, and remove it.



Note **Be careful not to press POWER Switch.**

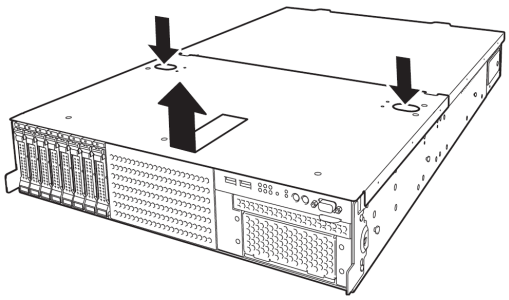
1.6 Removing Top Cover

You need to remove top cover when installing or removing the following component:

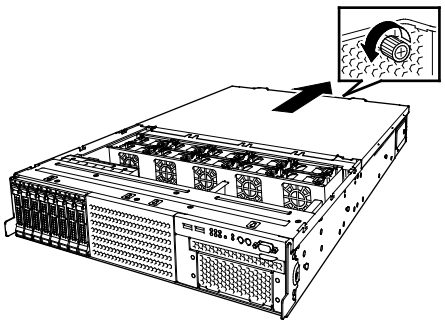
Optical disk drive,	LAN riser card,
DIMM,	processor,
TPM module,	Internal Flash Memory,
Additional HDD cage,	PCI card,
RAID Controller,	Battery for RAID Controller

Important **Before removing the top cover, be sure to disconnect cables from PCI card such as LAN adapter. If not, cables may be damaged.**

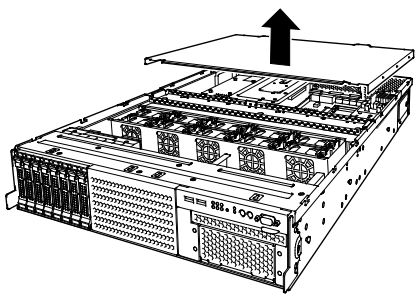
1. Refer to steps 1 to 4 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Slide the top cover toward the front of the server while pressing the lock button on the cover.
3. Lift off the top cover (front) from the server.



4. Loosen the thumb nut on rear of the server, and slide the top cover (rear) to rear side.

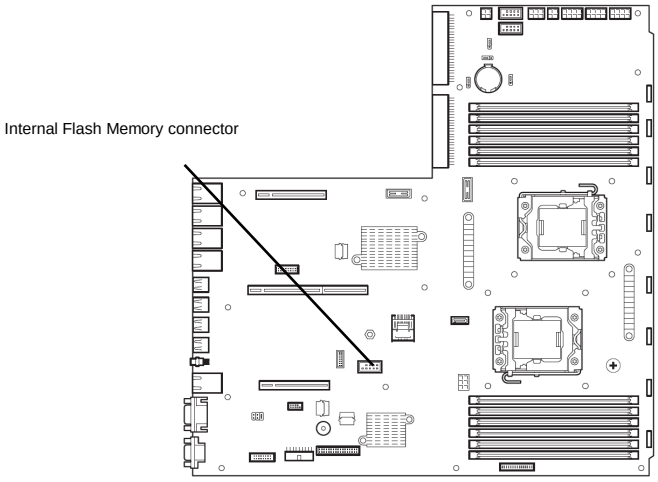


5. Lift the top cover (rear) and remove it.



1.7 Internal Flash Memory

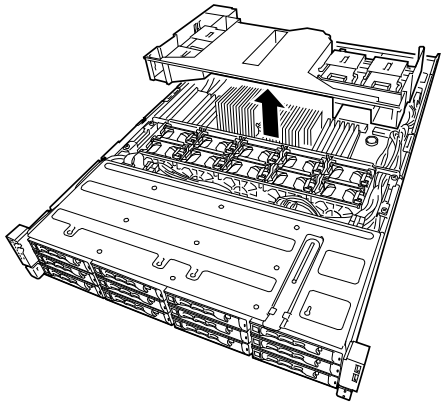
This section describes the procedure for installing the Internal Flash Memory.



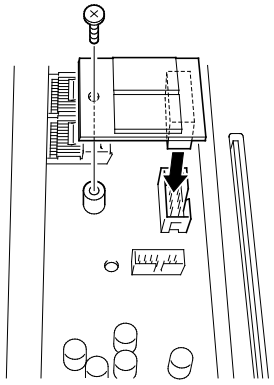
1.7.1 Installation

Install the Internal Flash Memory in the following procedure.

1. Refer to steps 1 to 6 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Remove the duct.



3. Attach the Internal Flash Memory and fix it with the screw provided with this product.

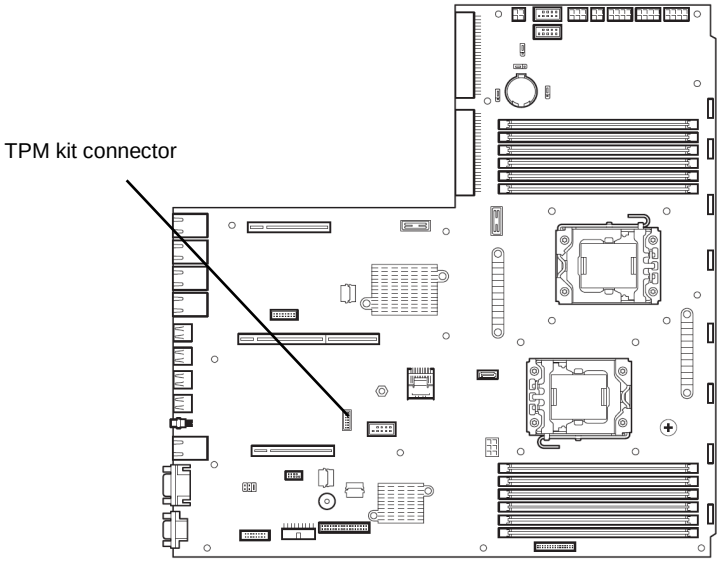


1.7.2 Removal

To remove the Internal Flash Memory, reverse the installation procedure.

1.8 TPM Kit

This section describes the procedure for installing the TPM Kit.

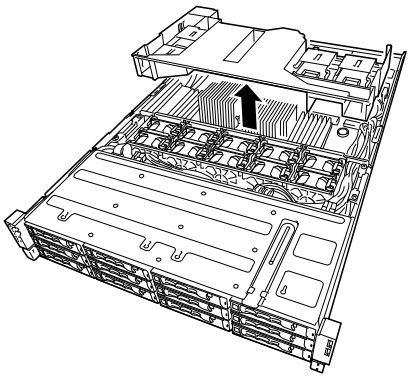


1.8.1 Installation

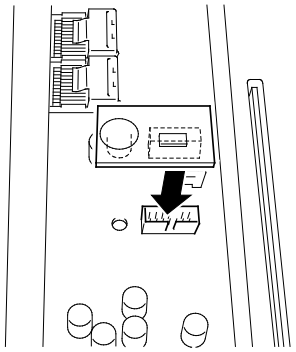
Install the TPM Kit in the following procedure.

Note **The TPM Kit once installed cannot be removed.**

1. Refer to steps 1 to 6 in *Chapter 2* (*1.3 Overview of Installation and Removal*) for preparations.
2. Remove the dict.



3. Install TPM Kit and secure it by pushing the nylon rivet provided with TPM Kit.



1.9 Processor (CPU)

The server may have another processor installed in addition to the standard processor, configuring multi-processor system.

Important

- **You must avoid static electricity to work with the procedure below. For details, refer to *Chapter 2 (1.2 Anti-static Measures)*.**
- **Do not operate the system until confirming that the additionally installed processor is in normal state.**
- **Make sure to use the processor authorized by NEC. Installing a third-party processor may cause a failure of the processor as well as the motherboard. Repair of the server due to failures or damage resulted from installing such a processor will be charged.**

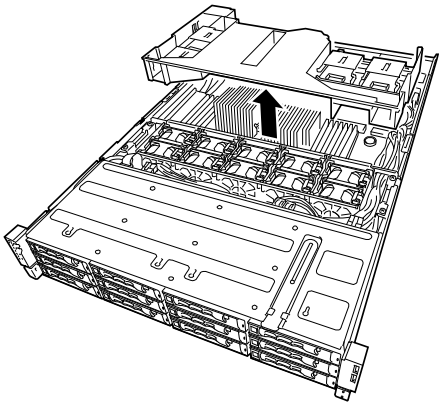
Tips

If the different revision of the processor is installed in the multiprocessor system, Windows logs the following information and displays it on System Viewer. If this message is logged, it is no problem for operation.

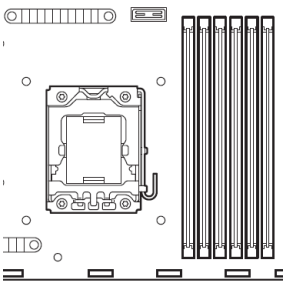
1.9.1 Installation

Follow steps below to install the processor.

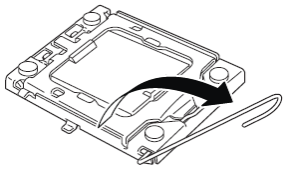
1. Refer to steps 1 to 6 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Remove the duct.



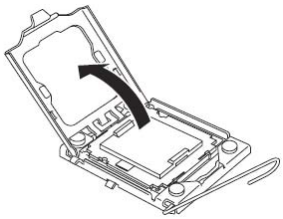
3. Locate the CPU socket to which you are going to install a processor.



4. Push down the socket lever once to unlatch it from the hook, then slowly open the lever until it stops.

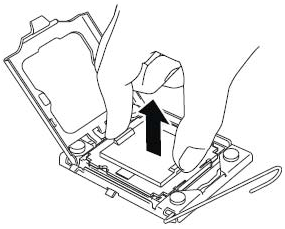


5. Lift the plate.



Important **You will see the CPU socket contacts. Do not touch the socket contacts.**

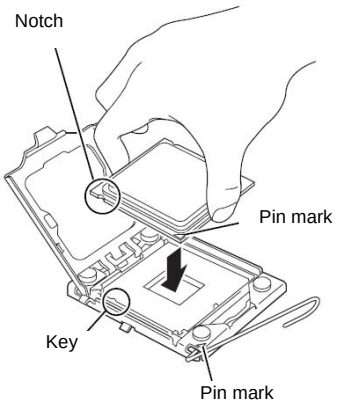
6. Remove the protective cover from the CPU socket.



Important **Keep the protective cover for future use. Always attach the CPU protective cover if the processor is removed from the socket.**

7. Put the additional processor on the CPU socket slowly and gently.

   For easy installation, hold edges of processor with your thumb and index fingers so that the notch is aligned with the key on the CPU socket.



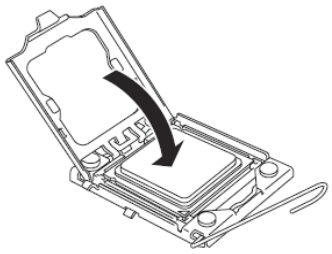
Important

- **Be sure to hold the processor only at the edges. Pay attention not to touch the bottom of the processor (pin section).**

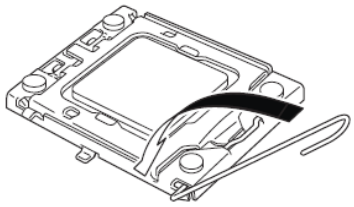
Note

- Insert the processor while aligning the notch on the processor with the key section on the CPU socket.
- Bring down the processor straight without tilting or sliding it in the socket.

8. Lightly push the processor to the CPU socket, and close the plate.



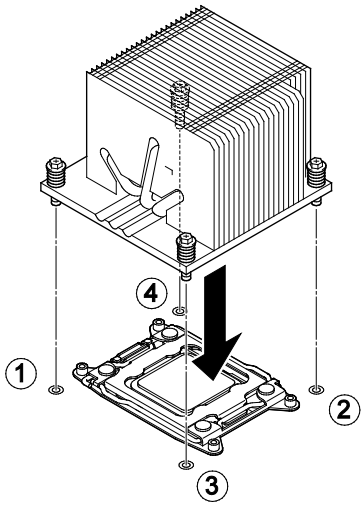
9. Close the socket lever to fix it.



10. Put the heat sink on processor and fix the heat sink with four screws.

    Temporarily tighten the four screws diagonally, then tighten them securely.

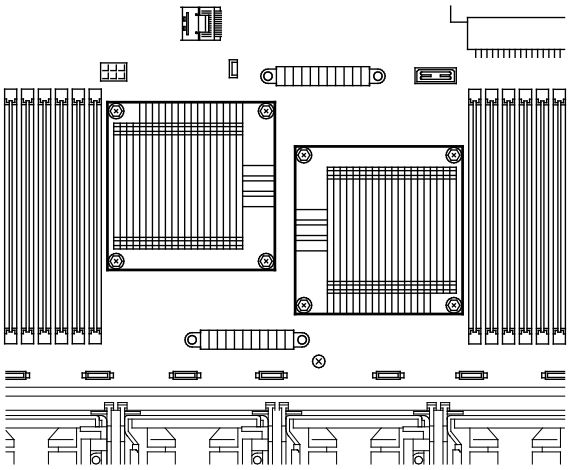
    Make sure that the screw aligns with the screw hole. If not, the screw may damage the motherboard.



Note

Make sure that the heat sink is properly attached and properly direction.

11. Make sure that the heat sink is installed on a level with the motherboard.



Important

- **If the heat sink is not level, remove it, and then install it again.**
  The following probably causes the heat sink not to be level:
  – The CPU is not positioned correctly.
  – All screws are not completely tightened.
- **Do not move the secured heat sink.**

12. If the CPU is additionally installed, you need to install the additional fan unit provided with additional CPU. Refer to *Chapter 2* (*1.16 Redundant Fan Unit*) for how to install an additional fan unit.
13. Install the components you removed in earlier steps.
14. If the CPU is additionally installed, run SETUP, select [Advanced] – [Processor Configuration] – [Processor Information], and confirm that [CPU ID], [L2 Cache RAM], and [L3 Cache RAM] are defined normally. Refer to *Chapter 2, 1.2.2 Advanced - Processor Information submenu in "Maintenance Guide"*.

1.9.2 Replacement / Removal

To remove processor (CPU), reverse the installation procedure.

Important

- **Do not remove any processor unless it is failed.**
- **After the operation, heat may make the cool seat at the bottom of the heat sink adhere to the processor. To remove the heat sink from the processor, first turn the heat sink to the left and right lightly to make sure that the heat sink can be apart from the processor. Removing the heat sink with it adhering to the processor may cause the processor and/or CPU socket to be defected.**

1.10 DIMM

Install a DIMM (Dual Inline Memory Module) to a DIMM socket on the motherboard in the server. The motherboard provides four sokets to install DIMMs.

Important

- **You must avoid static electricity to work with the procedure below. For details, refer to *Chapter 2 (1.2 Anti-static Measures)*.**
- **Use only the specified DIMMs. Installing a DIMM from a third party may damage not only the DIMM but the motherboard. You will be charged to repair failures or damages caused by the use of such products even within the warranty period. .**

Tips

Up to 768 GB (32 GB x 24) can be installed in 2-CPU configuration. Up to 384 GB (32 GB x 12) can be installed in 1-CPU configuration. No DIMM is factory installed in standard configuration.

1.10.1 Maximum supported memory size

The maximum available memory size on the server depends on the architecture (x86 architecture) and OS specs.

A list of maximum memory sizes

OS	The maximum memory size supported on each OS	The maximum memory size supported on the server
Windows Server 2003 R2 Standard Windows Server 2008 Standard x86 Edition	4 GB	4 GB (If using HW-DEP function) * Default factory settings
		About 3.3 GB (If not using HW-DEP function) Note: If you are not using the HW-DEP function, set the Execute Disable Bit (XD Bit) to Disable in the BIOS setup. It is enabled by default.
Windows Server 2008 R2 Foundation	8 GB	8 GB
Windows Server 2003 R2 Standard x64 Edition Windows Server 2008 Standard x64 Edition Windows Server 2008 R2 Standard	32 GB	32 GB
Windows Server 2003 R2 Enterprise Edition Windows Server 2008 Enterprise x86 Edition	64 GB	64 GB
Windows Server 2003 R2 Enterprise x64 Edition	1 TB	384 GB
Windows Server 2008 Enterprise x64 Edition Windows Server 2008 R2 Enterprise	2 TB	
RedHat Enterprise Linux 5 Server (x86)	16 GB	16 GB
RedHat Enterprise Linux 5 Server (EM64T)	256 GB	256 GB

1.10.2 Memory Clock

The server supports the memory clock speed of DDR3-800/1066/1333MHz. However, the actual memory clock speed depends on CPU model and memory configuration.

The memory clocks of all of buses operate at the same clock speed.

1.10.3 Memory RAS Feature

The server has RAS feature including "Standard memory feature (x4 SDDC ECC memory), "Memory mirroring feature", and "Memory LockStep feature (x8 SDDC ECC memory), and Memory Sparing feature. To use the memory mirroring or LockStep feature, refer to *Chapter 2 (1.10.7 Using Memory RAS Features)*.

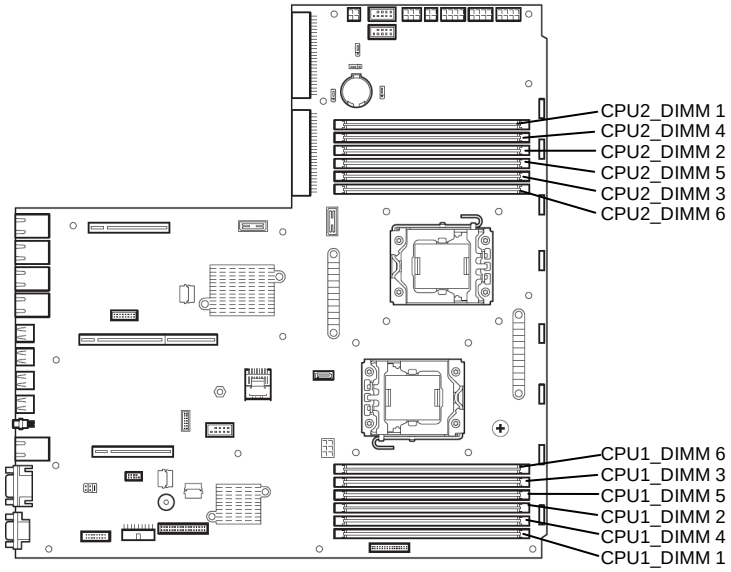
- Standard memory feature (x4 SDDC ECC memory)
- Memory Mirroring feature (restrictions imposed on DIMM configuration)
- Memory LockStep feature (x8 SDDC ECC memory) (restrictions imposed on DIMM configuration)
- Rank Sparing feature (restrictions imposed on DIMM configuration)

1.10.4 DIMM installation order

Note

- **DIMM installation order in 1-CPU configuration differs from that in 2-CPU configuration.**
- **If CPU2 is not installed, CPU2_DIMM1 to CPU2_DIMM6 are disabled.**

Installation order depends on features to be used. See the table below.



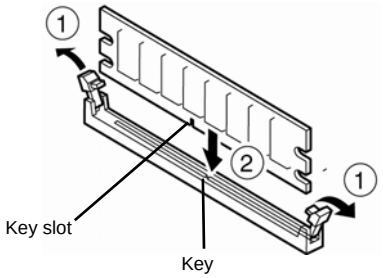
		Standard memory feature (Independent)		Lockstep feature/ Mirroring feature		Memory Sparing feature	
	DIMM number	1-CPU configuration	2-CPU configuration	1-CPU configuration	2-CPU configuration	1-CPU configuration	2-CPU configuration
CPU#1	CPU1_DIMM1	1	1	N/S	N/S	1	1
	CPU1_DIMM4	4	7	N/S	N/S	1	1
	CPU1_DIMM2	2	3	1	1	2	3
	CPU1_DIMM5	5	9	2	3	2	3
	CPU1_DIMM3	3	5	1	1	3	5
	CPU1_DIMM6	6	11	2	3	3	5
CPU#2	CPU2_DIMM1	-	2	-	N/S	-	2
	CPU2_DIMM4	-	8	-	N/S	-	2
	CPU2_DIMM2	-	4	-	2	-	4
	CPU2_DIMM5	-	10	-	4	-	4
	CPU2_DIMM3	-	6	-	2	-	6
	CPU2_DIMM6	-	12	-	4	-	6

N/S: Not supported, the slot is unavailable for this feature.

1.10.5 Installation

Install a DIMM by using the following procedure.

1. Refer to steps 1 to 6 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Lift the processor duct off the server.
3. Open levers on left and right sides of DIMM slot.
4. Push the DIMM straight into the socket.
   When a DIMM is inserted into the socket, the lever automatically closes.



Important

- **Make sure the orientation of the DIMM. The terminal side of a DIMM has a notch, preventing being wrongly inserted.**
- **Do not apply too much pressure when you push a DIMM into the socket. Doing so can damage the socket or terminal part.**

5. Continue to install or remove internal optional devices, mount and connect the server, and turn it on.
6. Confirm that no error messages are displayed in POST screen.
   If any error messages are displayed, refer to *Chapter 3 (1. POST Error Message)* in "*Maintenance Guide*".
7. Run the SETUP utility, and select **Memory Configuration** and then **Memory Information** from the **Advanced** menu. Make sure the capacity of added DIMM is displayed properly.
   Refer to *Chapter 2 (1. System BIOS)* in "*Maintenance Guide*".
8. Select **Memory Configuration** from the **Advanced** menu, and then specify **Yes** for **Memory Retest**. After that, select **Save Changes and Exit** to reboot.
9. Set the paging file size to the recommended value (Total memory size x 1.5) or more.
   If using a Windows OS, refer to *Chapter 1 (7.1 Specifying Memory Dump Settings (Debug Information))* in "*Installation Guide (Windows)*".
   For other OS, consult the manual provided with the operation system or contact the store where you purchased it or your maintenance service company.

1.10.6 Replacement / Removal

To remove DIMM, reverse the installation procedure.

Note When removing a defective DIMM, check error messages displayed at POST or NEC ESMPRO and check the DIMM socket where the defective DIMM is installed.

Take the steps below after replacing or removing DIMMs.

1. Confirm that no error messages are displayed on POST. If any error message is displayed, refer to *Chapter 3 (1. Post Error Message)* in "*Maintenance Guide*".
2. Run BIOS Setup Utility, select **Memory Configuration** from the **Advanced** menu, and then specify **Yes** for **Memory Retest**. After that, select **Save Changes and Exit** to reboot.
3. Set the size of Paging File to the recommended value (Total memory size x 1.5) or more.
   If using a Windows OS, refer to *Chapter 1 (7.1 Specifying Memory Dump Settings (Debug Information))* in "*Installation Guide (Windows)*".
   For other OS, follow the manual of the OS.

1.10.7 Using Memory RAS Features

The server has RAS feature including "Standard (independent) memory feature (x4 SDDC ECC memory)", "Memory mirroring feature", "Memory LockStep feature (x8 SDDC ECC memory)", and Memory Sparing feature. SDDC (Single Device Data Correction) allows automatic correction of memory error (multi-bit error).

Note

- To use the Memory Mirroring feature or Memory LockStep (x8 SDDC ECC memory) feature, additional memory board (N8102-493/494/495/496) is required.
- To use the Memory Sparing feature, additional memory board (N8102-497/498) is required.
- To use Standard (Independent) memory feature (x4 SDDC), additional memory board (N8102-489/490/491/492) is required.

The memory area on the motherboard of the server is divided into three memory channels as shown in the figure below.

The memory mirroring and LockStep features keep memory redundancy between memory two channels by monitoring or altering memory active/inactive status, respectively.

(1) Memory Mirroring Feature

The memory mirroring feature writes the same data into two groups of DIMMs corresponding with each other between memory channels (channels 2 and 3) to provide data redundancy.

Important

- **The memory mirroring feature uses channels 2 and 3. In memory mirroring configuration, the memory channel 1 of each CPU (CPU1-DIMM1/4, CPU2-DIMM1/4) is disabled.**
- **To use the Memory Mirroring feature, additional memory board (N8102-493/494/495/496), equipped with two DIMMs of same model, is required.**

Tips

The operating system only recognizes a half of the total physical capacity.

The memory mirroring feature can be used under the following conditions:

- Install DIMMs in two DIMM sockets configuring a mirror set.
- All the installed DIMMs should have the same capacity.
- Run SETUP (refer to *Chapter 2 (1. System BIOS)* in "*Maintenance Guide*"), change parameters appropriately in the [Mirror] menu selected as shown below, save the settings and exit from SETUP.
  [Advanced] – [Memory Configuration] – [Memory RAS Mode] – [Mirror]
  Run SETUP again, and check if the status of additionally installed DIMMs shows "Mirror".
- Installation order depends on CPU configuration. See the figure below.

The mirroring cannot be configured in the following case:

- Memory mirroring within a specific memory channel

Notes on Configuring Memory Mirroring
If you install or remove DIMMs that unable to configure memory mirroring, parameter for [Memory RAS Mode] is changed from "Mirror" to "Independent".

(2) Memory LockStep Feature (x8 SDDC)

In Memory LockStep feature, the DIMMs in two groups corresponding to two memory channels (channels 0 and 1) is multiplexed and operated in parallel to enable x8 SDDC (x8 Single Device Data Correction). With this feature, a single device can detect and correct one to eight-bit error.

Important

- **The Memory LockStep feature uses channels 2 and 3. In Memory LockStep configuration, the memory channel 1 of each CPU (CPU1-DIMM1/4, CPU2-DIMM1/4) is disabled.**
- **To use Memory LockStep feature, additional memory board N8102-493/494/495/496 (equipped with four DIMMs of same model) is required.**

The LockStep feature can be used under the following conditions:

- Install two DIMMs that operate in parallel in memory socket.
- All the installed DIMMs should have the same capacity.
- Run SETUP (refer to *Chapter 2 (1. System BIOS)* in "*Maintenance Guide*"), change parameters appropriately in the [LockStep] menu selected as shown below, save the settings.
  [Advanced] – [Memory Configuration] – [Memory RAS Mode] – [Lock Step]
- Run SETUP again, and check if the status of additionally installed DIMMs shows "LockStep".
- Installation order depends on CPU configuration. See the figure below.

The LockStep cannot be configured in the following cases:

- LockStep between memory channels of different memory controllers (CPU)
- LockStep within the same memory channel

Notes on Configuring LockStep
If you install or remove DIMMs that unable to configure Memory LockStep, parameter for [Memory RAS Mode] is changed from "LockStep" to "Independent".

(3) Memory Sparing Feature

The memory sparing feature puts a memory Rank of a memory controller in each CPU into standby status as spare devices. If an unrecoverable error occurs in a Rank in the running memory controller, the feature automatically changes the running Rank from the failed one to a Rank in the standby state to continue the processing.

Important

- **To use the Memory Sparing feature, additional memory board N8102-497/498 (equipped with two DIMMs of same model) is required.**
- **To use the Memory Sparing feature, DIMMs to be installed should have the same capacity.**

Tips

- **The operating system recognizes the DIMMs as those with capacities less than the actual physical capacities. (The recognized capacities vary depending on the number of DIMMs and the physical capacity per DIMM.)**

The Memory Sparing feature can be used under the following conditions:

- DIMMs to be installed should have the same capacity.
- Run SETUP (refer to *Chapter 2 (1. System BIOS)* in "*Maintenance Guide*"), change parameters appropriately in the [Sparing] menu selected as shown below, save the settings.
  [Advanced] – [Memory Configuration] – [Memory RAS Mode] – [Sparing]
- Run SETUP again, and check if the status of additionally installed DIMMs shows "Sparing".
- Installation order depends on CPU configuration. See the figure below.

The following Memory sparing cannot be configured.

- A DIMM of different capacity is installed.

Notes on Configuring Memory Sparing

If you install or remove DIMMs that unable to configure Memory Sparing, parameter for [Memory RAS Mode] is changed from "Spared" to "Independent".

1.11 Extra Battery for RAID Controller

If a RAID Controller (N8103-149/150/151/160) is installed, use the optional extra battery to avoid data loss caused by accidents including temporary blackout during a Write Back operation. The model of the extra battery to be used depends on RAID Controller.

- For N8103-149/150/151, use N8103-153 extra battery
- For N8103-160, use N8103-162 extra battery

1.11.1 Handling precautions

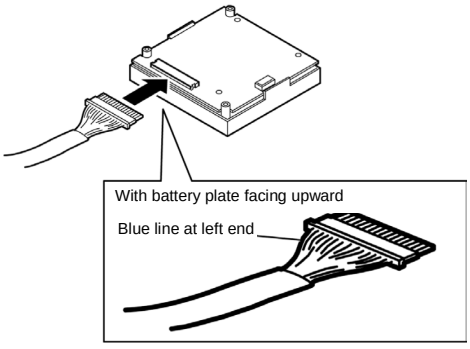
Described below are the precautions to be observed whenever using the extra battery. Be sure to observe the following, otherwise property such as data or other devices might be destroyed.

- Use the extra battery dedicated to the RAID Controller you are using.
- The extra battery is a very delicate electronic device. Before installation, touch the metal frame part of the server to discharge the static electricity from your body.
- Do not drop or bump the extra battery.
- For recycling and disposing of the extra battery, refer to the User's Guide that comes with it.

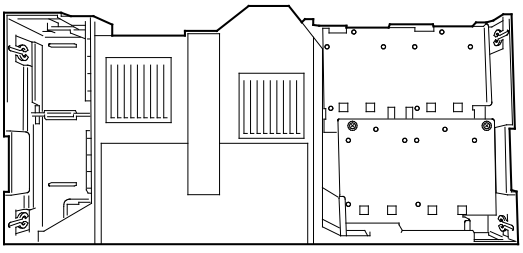
1.11.2 Installing N8103-153/162 extra battery

This section describes the procedure of installing an extra battery for RAID Controller.

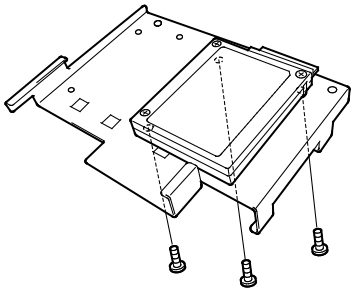
1. Refer to *Chapter 2* (*1.3 Overview of Installation and Removal*) for preparations.
2. Lift the processor duct off the server and remove it.
3. Remove the riser card. For how to remove the riser card, refer to *Chapter 2 (1.13 PCI Card*).
4. Connect the cable to the additional battery.
   When connecting the cable, orient the cable so that its marking will fit the connector.



5. Remove the battery bracket from the duct.



6. Install an additional battery to processor duct.
   Position to install an additional battery depends on the position where RAID Controller is installed. See the figure to the right.
   (The number indicates installation order.)



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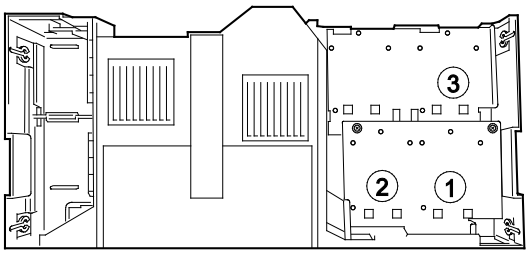
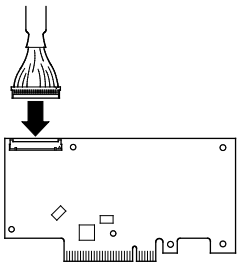


7. Connect the cable of additional battery to RAID Controller.



8. Attach the RAID Controller to the rise card.
   For how to install RAID Controller, refer to *Chapter 2 (1.13 PCI Card*).
9. Insert the riser card into the slot of the motherboard and fix the riser card with the screw which you removed in earlier step.
   For how to install riser card, refer to *Chapter 2 (1.13 PCI Card*).

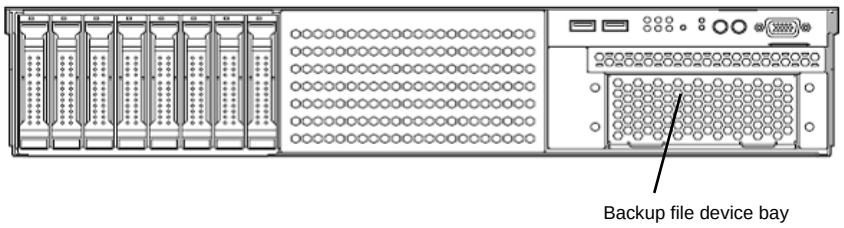
1.11.3 Removal

For removing the extra battery for the RAID Controller, reverse the installation procedure.

1.12 Backup File Device

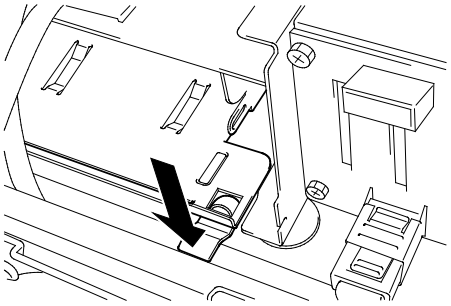
The 16x 2.5-inch drive model has one slot for installing a backup file device such as a magnetic tape drive.

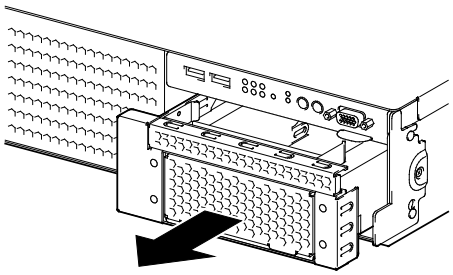
Important **Install only a backup file device specified by NEC.**



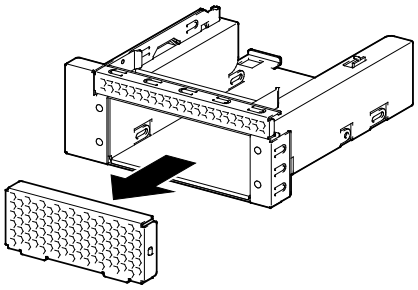
1.12.1 Installation (USB File Devices)

1. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Remove the processor duct from the server.
3. Push the lever of the cage to unlock it, then take the device carrier out of front of the server.



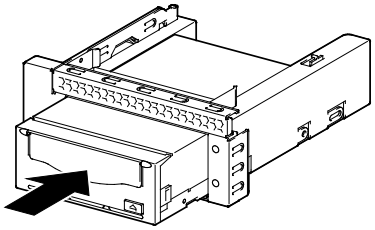


4. Remove the blank cover from cage.

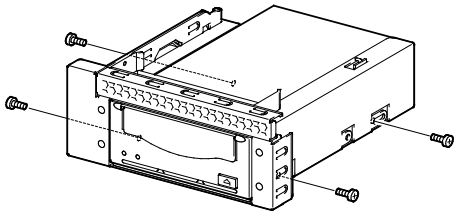


Important **Keep the removed blank cover for future use.**

5. Insert the backup file device into the cage.



6. Secure the backup file device with the screws provided with the backup file device.

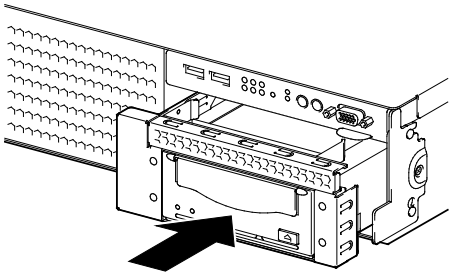


Note

- Be sure to use the screws provided with the server.
- Position the backup file device so that the device screw holes align with the screw holes in the device carrier.
- If you feel difficult to connect the cable of the long device, slide the device to the front and then connect the cable.

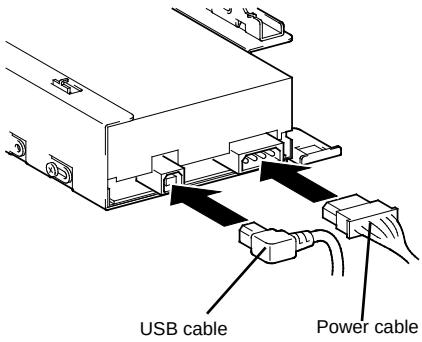
7. Insert the device carrier into the backup file device bay.

   Since power cable is not yet connected, insert the device carrier halfway.

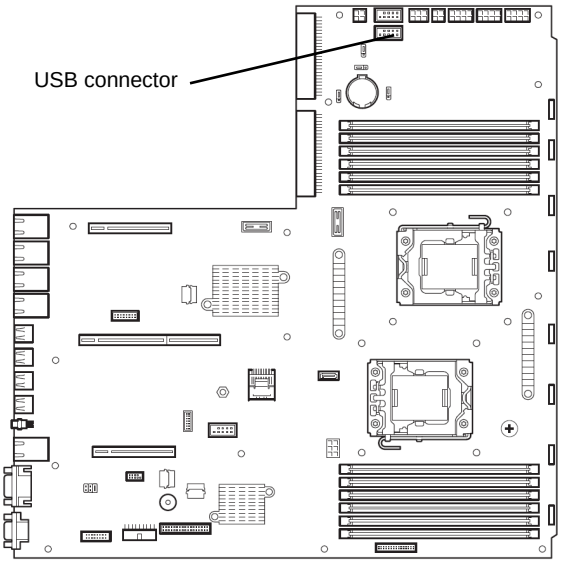


8. Connect the power cable and interface cable to the backup file device.

   Connect the power cable provided with the server and separately-priced USB cable (K410-194/195(00)) to the backup file device.



9. Connect the USB cable to the USB connector on motherboard.



Note Make sure that the USB cable does not touch any electrical component on motherboard.

10. If internal MO or internal RDX is installed, run BIOS SETUP and set the boot priority of removable device to lower than the boot device.
[Boot] → [Boot Option #2] → [(Bus 08 Dev XX) PCI RAID Adapter]

11. Install the device driver for the backup file device.
Refer to the manual that comes with the backup file device.

1.12.2 Removal

Remove the backup file device in reverse order of the installation steps.

1.13 PCI Card

The server provides two types of riser cards where you can install a PCI card and a riser card dedicated to RAID Controller. The riser cards can have three full-height PCI card, two low-profile PCI card, and one RAID Controller card (six PCI cards can be installed in total).

Important **You must avoid static electricity to work with the procedure below. For details, refer to *Chapter 2 (1.2 Anti-static Measures)*.**

1.13.1 Notes

Read the following notes when installing or removing a PCI card.

- Do not touch the terminals of the riser cards and the leads of electronic components with your bare hand. Fingerprints and dust left on them cause the server to malfunction due to a connection failure or damage to the leads.
- Available type of PCI card depends on riser card. Make sure the card type before connecting it to riser card.
- The server provides no connector to connect a LED connector which is supplied in RAID Controller used to indicate disk access.
- PCI slot number "1A" is assigned to the RAID controller-dedicated slot . “1B”,”2B”,”1C","2C” is assigned to the riser card for low-profile PCI cards The “3B” is assigned to the riser card for full height PCI card.
- The PCI devices of the same type (including onboard PCI device) may be recognized in different order from that described above, depending on OS or RAID System BIOS utility. Check the slot location of PCI device by PCI bus number, device number and function number shown in Chapter4 Appendix 2 PCI Configuration.
- Before removing the top cover, be sure to disconnect cables from PCI card such as LAN adapter. If not, cables may be damaged.
- If an additional LAN card is installed, it is hard to push the catch of the cable connector with your finger that is connected to the LAN card. Disconnect the connector pushing the catch with a standard screwdriver. At this time, be very careful for the screwdriver not to damage the LAN card or other cards.
- Set **Disabled** for the optional ROM of a LAN device not to be booted by using the BIOS Setup utility.
- If a bootable device such as a PCI card or USB device is added, the boot order may change. In the BIOS Setup utility, select **Hard Drive BBS Priorities** from the **Boot** menu, and then specify a higher priority for the boot device.
  Boot → **Hard Drive BBS Priorities** → Check the display
  If the boot device is an HDD under an optional RAID Controller, the display is `(Bus xx Dev 00) PCI RAID Adapter`. Note that the value for *xx* changes depending on the PCI slot where a RAID board is installed.
- For a RAID Controller, LAN card (network boot), or Fibre Channel controller, if no hard disk drive on which an OS is installed is connected, set the option ROM for that slot to **Disabled**. Refer to *Chapter 2 (1. System BIOS)* in "*Maintenance Guide*" for how to specify it.

1.13.2 Supported cards and available slots

The following tables list supported cards and slots available for them. For details of the functions of each board, refer to the manual supplied with the card.

Tips Different cards mounted on the same bus operate at the lower frequency.

Product number	Product name	Slot number	PCIe 3.0 #1A	PCIe 3.0 #1B	PCIe 3.0 #2B	PCIe 3.0 #3B	PCIe 2.0 #1C	PCIe 2.0 #2C	Remarks
		PCI slot performance *1	X8 lane	X4 lane		X8 lane	X1 lane	X4 lane	
		Socket type	X8 socket				X4 socket	X8 socket	
		Transfer bandwidth (per lane) *1	8Gb/s				5Gb/s		
		Slot size	Dedicated to RAID Controller	Low profile (bracket shape is for full-height card)		Full height	Low profile		
		Available card size	Dedicated to RAID Controller	197mm max.		177mm max.			
N8103-149	RAID Controller (512MB, RAID 0/1) [PCI Express 2.0(x8)]		○	–	–	–	–	–	Dedicated to connect with internal hard disk drive. 26 x2.5-inch drive model and 3.5-inch disk drive model require any one of RAID Controller. Additional battery N8103-153 can be mounted. Total of 3 (internal: 1, external: 2) RAID Controller can be installed. Only one additional battery can be mounted.
N8103-150	RAID Controller (512MB, RAID 0/1/5/6) [PCI Express 2.0(x8)]		○	–	–	–	–	–	
N8103-151	RAID Controller (1GB, RAID 0/1/5/6) [PCI Express 2.0(x8)]		○	–	–	–	–	–	
N8103-160	RAID Controller (1GB, RAID 0/1/5/6) [PCI EXPRESS 2.0(x8)]		–	○	○	○	–	○	Dedicated to connect with external devices. Additional battery N8103-162 can be mounted. Up to two additional batteries can be mounted.
N8103-104A	SAS Controller [PCI Express(x8)]		–	○	○	○	–	○	Dedicated to connect with external devices. Up to three cards can be installed.
N8103-142	SAS Controller [PCI Express 2.0(x8)]		–	○	○	○	–	○	
N8190-153	Fibre Channel Controller (8Gbps/Optical) [PCI Express 2.0(x8)]		–	○	○	○	–	○	Dedicated to connect with external Fibre Channel devices.
N8190-154	Fibre Channel Controller (2ch) (8Gbps/Optical) [PCI Express 3.0(x8)]		–	○	○	○	–	○	
N8104-138	1000BASE-T Adapter (1ch) [PCI Express 2.0(x1)]		–	○	○	○	○	○	For additional LAN port. Teaming (AFT/SFT/ALB) and bonding with onboard LAN (including additional riser card) and N8104-138/132/133 is supported.

Product number	Product name	Slot number	PCIe 3.0 #1A	PCIe 3.0 #1B	PCIe 3.0 #2B	PCIe 3.0 #3B	PCIe 2.0 #1C	PCIe 2.0 #2C	Remarks
		PCI slot performance *1	X8 lane	X4 lane		X8 lane	X1 lane	X4 lane	
		Socket type	X8 socket				X4 socket	X8 socket	
		Transfer bandwidth (per lane) *1	8Gb/s				5Gb/s		
		Slot size	Dedicated to RAID Controller	Low profile (bracket shape is for full-height card)		Full height	Low profile		
		Available card size	Dedicated to RAID Controller	197mm max.		177mm max.			
N8104-132	1000BASE-T Adapter (2ch) [PCI Express 2.0(x1)]	–	○	○	○	○	○		For additional LAN port. Teaming (AFT/SFT/ALB) and bonding with onboard LAN (including additional riser card) and N8104-138/132/133 is supported.
N8104-133	1000BASE-T Adapter (2ch) [PCI Express 2.0(x1)]	–	○	○	○	–	○		For additional LAN port. Teaming (AFT/SFT/ALB) and bonding with onboard LAN and N8104-138/132/133 is supported.
N8104-128	10GBASE Adapter (SFP+/2ch) [PCI Express 2.0(x8)]	–	○	○	○	–	○		For additional LAN port. Prepare SFP+ module N8104-129 if needed. Teaming (AFT/SFT/ALB) and bonding with N8104-128 is supported.
N8104-131	10G Converged Network Adapter (2ch) (10Gbps/Optical) [PCI Express 2.0(x8)]	–	○	○	○	–	○		For additional DCB/FcoE. SFP module is factory-installed. Teaming/bonding with LAN is not available.
N8117-01A	Additional RS-232C connector kit *3	–	○	○	○	○	○		For additional serial port A (RS-232C)

● Installed as standard ○ Can be installed – Cannot be installed

*1 Lane: Indicates the transfer performance (transfer bandwidth).

<e.g.> For PCI Express
1 lane = 2.5 Gbps (unidirectional), 4 lanes = 10 Gbps (unidirectional)
For PCI Express 2.0
1 lane = 5 Gbps (unidirectional), 4 lanes = 20 Gbps (unidirectional)
Socket: Indicates the connector size. A card up to the number of sockets can be connected.

<e.g.> x4socket = x1card, x4card can be installed. x8 card cannot be installed.

* For details of functions of each card, refer to the technical guide.
* The card performance described in the parentheses after the Product name indicates the maximum operation performance of the card.
* When the operation performance of a PCI card is higher than the PCI slot on the server, the PCI card operates with the performance of the PCI slot on the server.

1.13.3 Installation

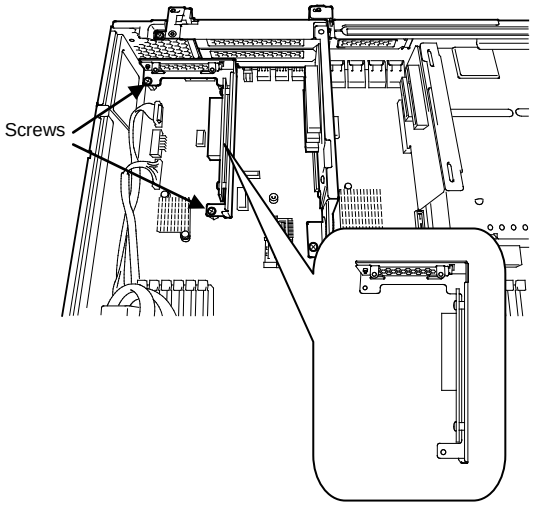
Install a riser card to a PCI card in the following procedure.

Important **When installing a PCI card, make sure the connector of the card fits the connector of the riser card.**

Note
- Check the card type (low profile or full-height type) which respective riser card supports and the type of PCI card to be installed.
- To install an extra battery for RAID Controller, refer to *Chapter 2 (1.11 Extra Battery for RAID Controller)*.

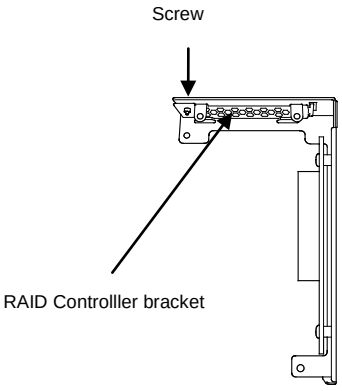
[Installing RAID Controller card in slot PCI #1A]

1. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Remove the screw securing the rise card. Hold the both ends of the riser card and lift it off.



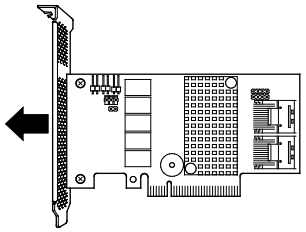
Note Be careful not to contact with other parts.

3. Confirm the installation position with the reference to the table in (*1.13.2 Supported cards and available slots*).
4. Remove the screw, and remove RAID Controller bracket from the rise card.

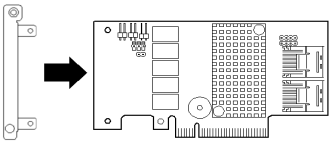


Note Keep the slot cover for future use.

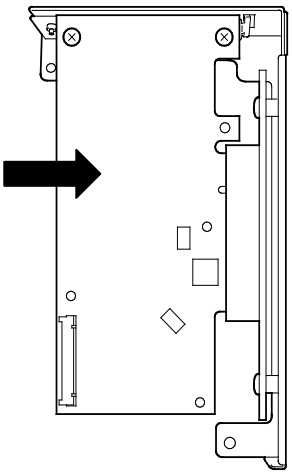
5. Remove the two screws from RAID Controller, and remove PCI bracket.



6. Install the controller bracket to RAID Controller with two screws you have removed in Step 5.



7. Install RAID Controller to the riser card. When installing the card, position the terminal part of the PCI card to the riser card slot and insert it.



Important **Do not touch the terminal part of riser cards or PCI cards and the signal pins of electric parts installed on the card. Installing cards with dirt or oil can cause malfunction.**

Note

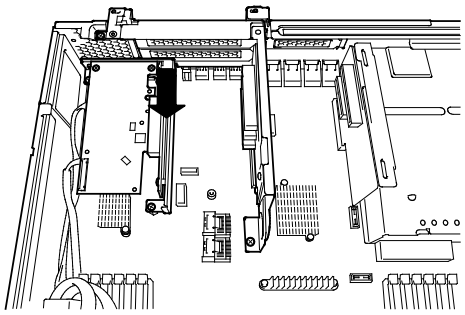
- Make sure that the head of a PCI card bracket is seated into the fixed slot.
- Depending on type of PCI cards, the terminal part of the PCI card may be too large to fit in the connector.
- If you have trouble in installing the card, remove the card once and try again. If you apply excessive pressure on the card, a PCI card or riser card might break.

Tips Connect a cable between connector on HDD backplane and RAID card before installing the riser card to the server.

8. Secure the RAID Controller bracket with a screw you have removed in Step 3.

9. Insert the riser card into the slot on motherboard.
   When connecting the card, position the terminal part of the card to the slot on the motherboard and insert it.

10. Secure the card with two screws you removed in Step 2.



11. Continue to install or remove internal optional devices, mount and connect the server, and turn it on.

12. Make sure that no error messages are displayed on POST screen.
    For details on POST error messages, refer to *Chapter 3 (1. POST Error Message)* in "*Maintenance Guide*".

13. Start the BIOS Configuration utility on the mounted board to set up the board.
    Availability or startup and operation procedure of the utility depends on board. For details, refer to the manual that comes with the board. If a PCI card including RAID Controller, SCSI controller, and LAN card which connects to any bootable device is added, the boot priority might be changed to the default setting. In that case, configure the boot priority in the **Boot** menu of the BIOS Setup utility.
    For details about the **Boot** menu, refer to *Chapter 2 (1.2.5 Boot)* in "*Maintenance Guide*".

(1) When using the optional controller (N8103-149/150/151)

For details, refer to the manual that comes with optional RAID Controller (N8103-149/150/151).

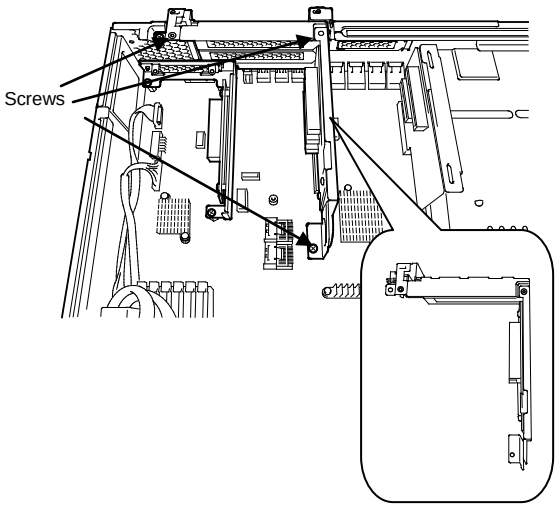
Important **You must avoid static electricity to work with the procedure below. For details, refer to *Chapter 2 (1.2 Anti-static Measures)*.**

Note

- When installing an optional RAID Controller, start the BIOS Setup utility, select **PCI Configuration** from the **Advanced** menu, and then make sure that the parameter of **PCI Slot *xx* ROM** (*xx* is PCI slot number) is set to **Enabled**.
- When connecting a RAID Controller, set the boot priority to 8th or higher in the Boot menu of the BIOS Setup utility. If the setting is 9th or lower, the configuration menu for RAID Controllers cannot be launched.

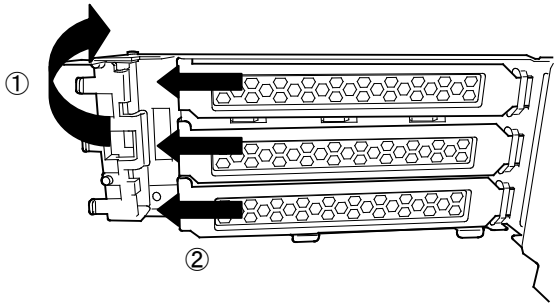
[Installing optional PCI card in slot PCI #1B, 2B, 3B, 1C, or 2C]

1. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations..
2. Remove the three screw securing the rise card B. Hold the both ends of the riser card B and lift it straight to remove.



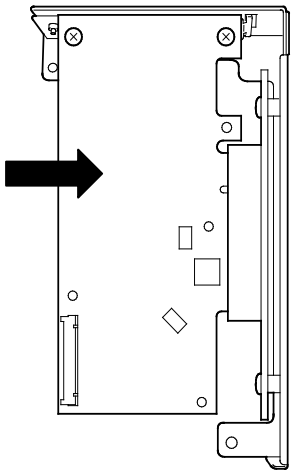
Note Be careful not to contact with other parts.

3. Confirm the installation position with the reference to the table in (*1.13.2 Supported cards and available slots*).
4. Remove the blank cover from the rise card (common to PCI slots #1B to 3B, 1C, and 2C) .



Note Keep the blank cover for future use.

5. Install a PCI card to the riser card.
When installing the card, position the terminal part of the PCI card to the riser card slot and insert it.



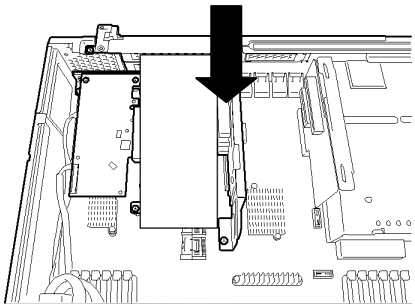
Important **Do not touch the terminal part of riser cards or PCI cards and the signal pins of electric parts installed on the card. Installing cards with dirt or oil can cause malfunction.**

Note
- Make sure that the head of a PCI card bracket is seated into the fixed slot.
- Depending on type of PCI cards, the terminal part of the PCI card may be too large to fit in the connector.
- If you have trouble installing the card, remove the card once and try again. If you apply excessive pressure on the card, a PCI card or riser card might break.

6. Secure the PCI card.

Tips Connect a cable between connector on motherboard and PCI card before installing the riser card to the server.

7. Insert the riser card B into the slot on motherboard , and secure the card with the three screws you removed at Step 2.
When connecting the card, position the terminal part of the card to the slot on the motherboard and insert it.



8. Continue to install or remove internal optional devices, mount and connect the server, and turn it on.
9. Make sure that no error messages are displayed on POST screen.
For details on POST error messages, refer to *Chapter 3 (1. POST Error Message)* in "*Maintenance Guide*".
10. Start the BIOS Configuration utility on the mounted board to set up the board.
Availability or startup and operation procedure of the utility depends on board. For details, refer to the manual that comes with the board. If a PCI card including RAID Controller, SCSI controller, and LAN card which connects to any bootable device is added, the boot priority might be changed to the default setting. In that case, configure the boot priority in the **Boot** menu of the BIOS Setup utility. For details about the **Boot** menu, refer to *Chapter 2 (1.2.5 Boot)* in "*Maintenance Guide*".

(2) When using the optional controller (N8103-160)

For details, refer to the manual that comes with optional RAID Controller (N8103-160).

Important

- **You must avoid static electricity to work with the procedure below. For details, refer to *Chapter 2 (1.2 Anti-static Measures)*.**
- **Do not change the mode to hibernate when building a RAID System.**

Note

- When installing an optional RAID Controller, start the BIOS Setup utility, select **PCI Configuration** from the **Advanced** menu, and then make sure that the parameter of **PCI Slot *xx* ROM** (*xx* is PCI slot number) is set to **Enabled**.
- When connecting a RAID Controller, set the boot priority to 8th or higher in the Boot menu of the BIOS Setup utility. If the setting is 9th or lower, the configuration menu for RAID Controllers cannot be launched.

1.13.4 Removal

To remove a riser card, reverse the installation procedure. Hold the card firmly and remove it. When removing it, have another person hold the server so that the server does not move.

If needed, run SETUP utility, and then specify the boot order from the **Boot** menu. For details about the **Boot** menu, refer to *Chapter 2 (1. System BIOS)* in "*Maintenance Guide*".

If using the server while the card is removed, attach the slot cover that comes with the riser card.

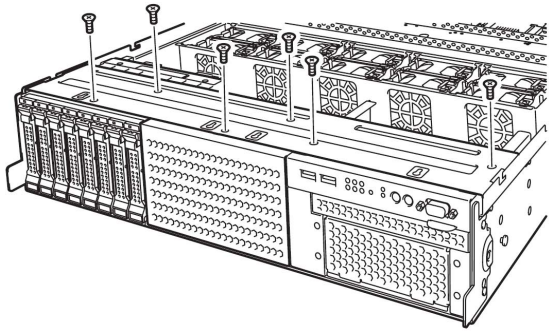
1.14 Additional HDD Cage

The server of 16x 2.5-inch hard disk drive model can have additional HDD cage for installing additional hard disk drives.

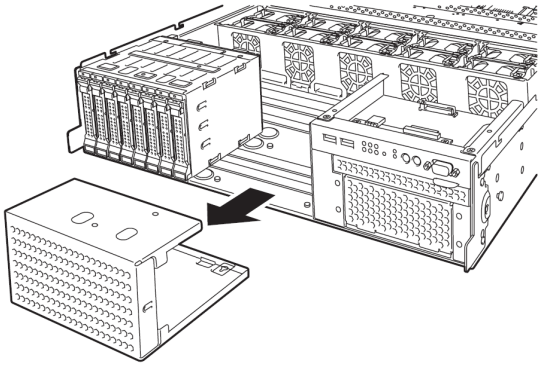
1.14.1 Installation

Follow steps below to install an additional HDD cage.

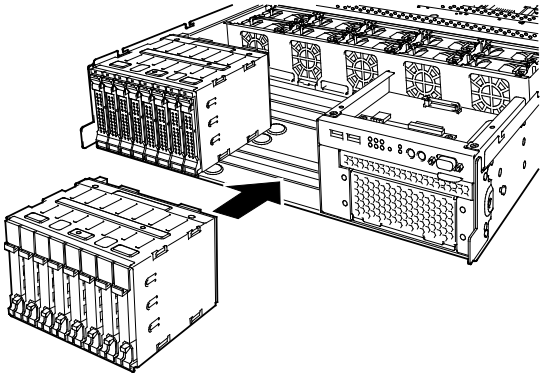
1. Refer to steps 1 to 6 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Remove the six screws from protective cover, and remove the protective cover.



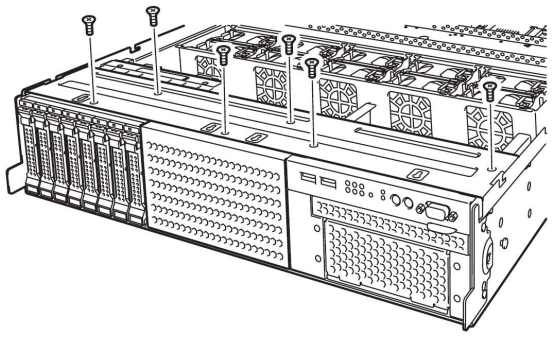
3. Remove the blank cover of 2.5-inch HDD cage bay by pulling it toward you.



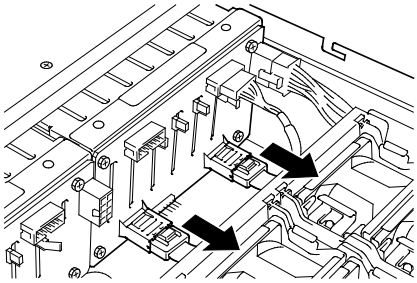
4. Install the additional HDD cage.



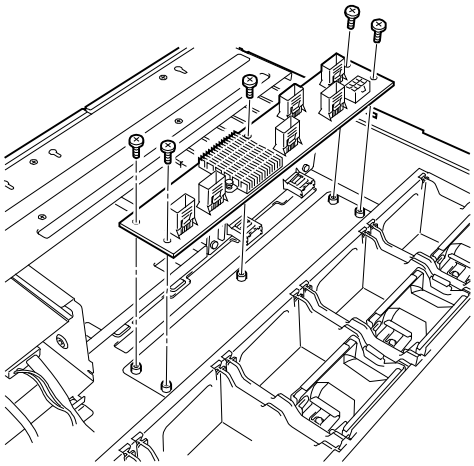
5. Secure the protective cover with six screws you have removed in Step 2.



6. Disconnect SAS cable from the factory-installed HDD cage.

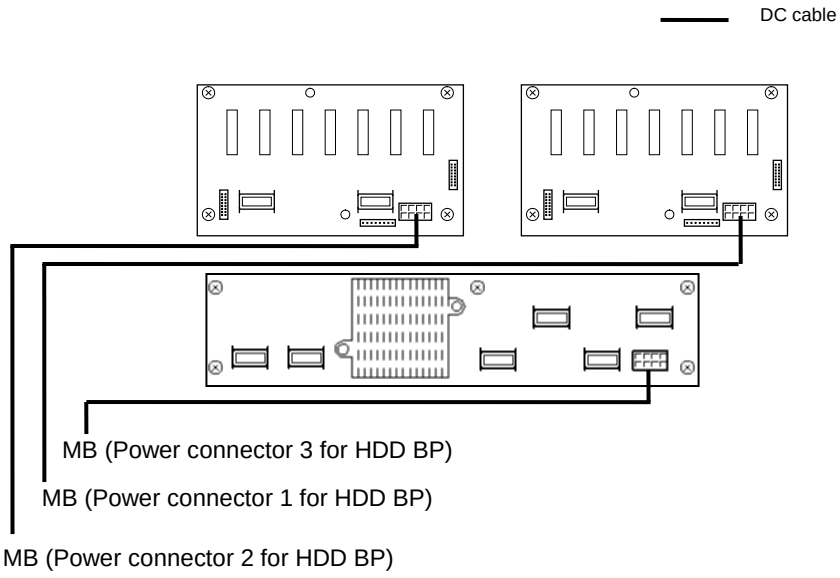


7. Install expander board to Expansion Bay and secure it with five screws provided with 2.5-inch HDD cage.



8. Connect the two SAS cables (long) provided with the server to RAID Controller and Expander board. (Refer to *Chapter 2 (1.18 Use of Internal Hard Disk Drives in the RAID System)*.)

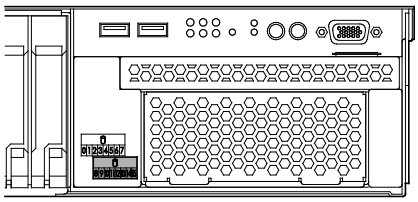
9. Connect the provided DC cable to Expander board and additional HDD cage.



10. Connect the SAS cable (short) provided with additional HDD cage to Expander Board, factory-installed HDD cage, and additional HDD cage. (Refer to *Chapter 2 (1.18 Use of Internal Hard Disk Drives in the RAID System)*.)

11. Connect the SGPIO cable provided with additional HDD cage to factory-installed HDD cage and additional HDD cage. (Refer to *Chapter 2 (1.18 Use of Internal Hard Disk Drives in the RAID System)*.)

12. Attach the ID label to the front face of chassis.



Note Keep the removed blank cover for future use.

1.14.2 Removal

To remove an additional HDD cage, reverse the installation procedure.

Important **To maintain the cooling effect in the server, install the blank cover in the vacant slot.**

1.15 Additional HDD Cage (Rear)

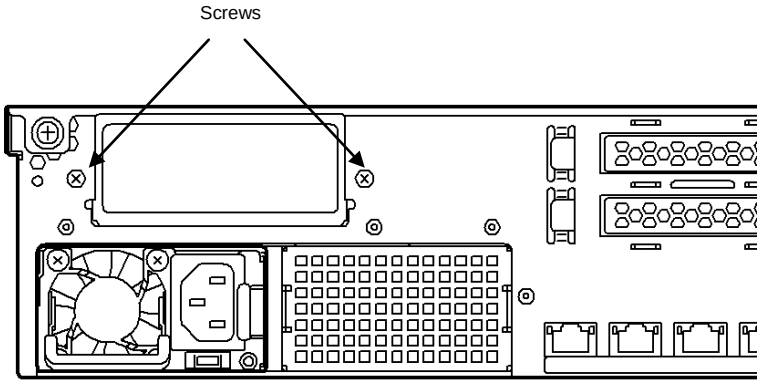
The server of 26x 2.5-inch hard disk drive model and 3.5-inch hard disk drive model can have additional HDD cage (rear) for installing additional hard disk drives.

1.15.1 Installation

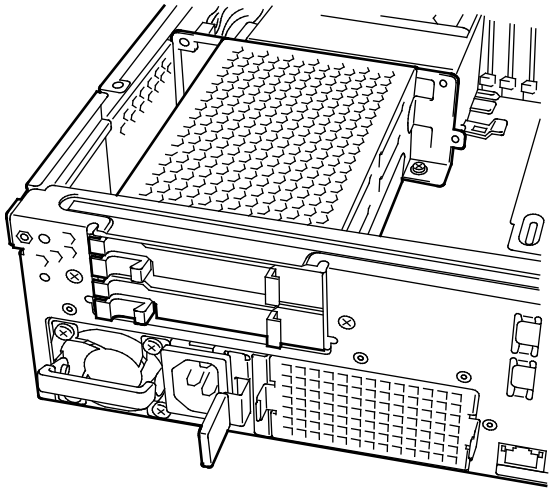
Follow steps below to install an additional HDD cage (rear).

1. Refer to steps 1 to 6 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.

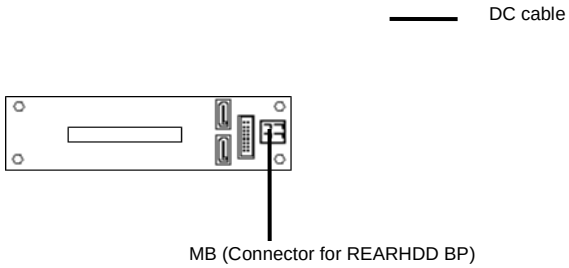
2. Remove the two screws and remove the blank cover from 2.5-inch HDD cage bay.



3. Install the additional HDD cage and secure it with two screws you have removed in Step 2.

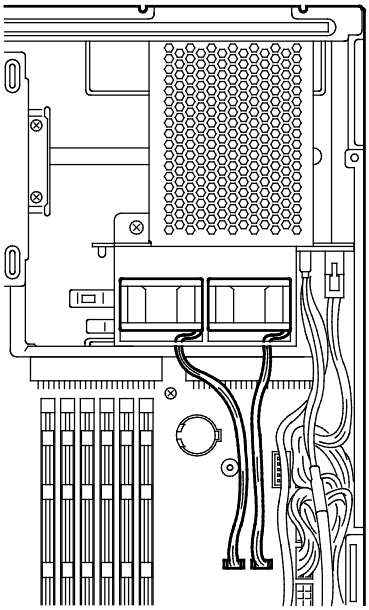


4. Connect the provided DC cable to additional HDD cage.



5. Connect the provided SATA cable and SGPIO cable to additional HDD cage.

6. Install the provided fan unit, and connect with the connector on motherboard.

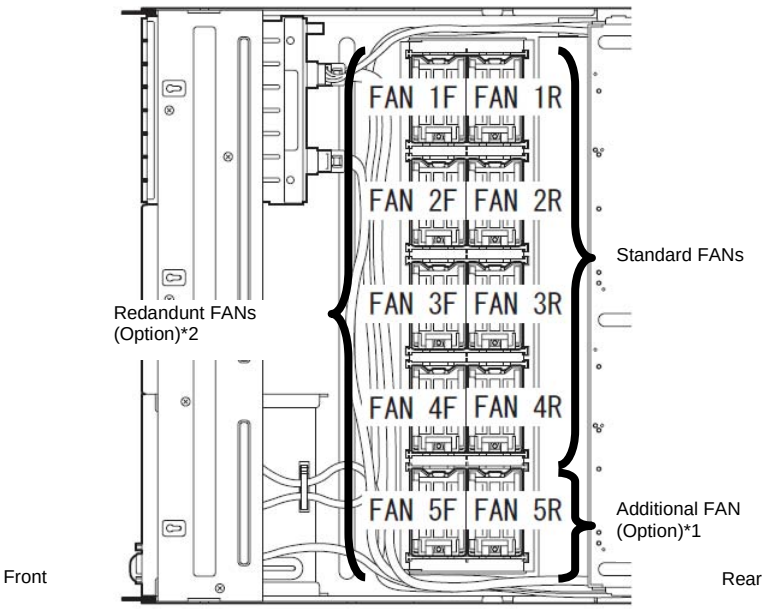


1.16 Redundant Fan Unit

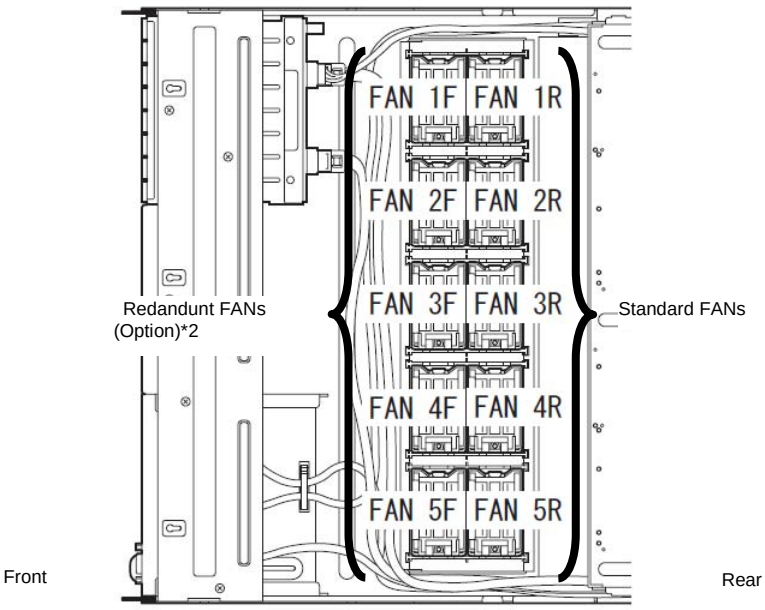
The server can work with redundant cooling fan system by adding an optional fan unit.

The figure below shows the slot numbers assigned to the slots of standard cooling fans and optional cooling fans.

16x 2.5-inch drive model



26x 2.5-inch drive model
3.5-inch drive model



*1 Expansion FAN is installed in FAN 5R when Expansion CPU is installed

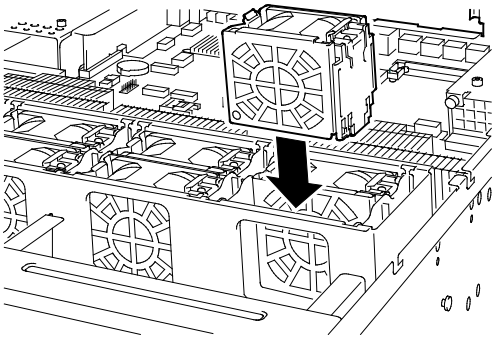
*2 Redandunt FANs are installed in FAN1F-3F and 5F when one CPU is installed
Redandunt FANs are installed in FAN1F-5F when two CPU are installed.

1.16.1 Installation

Take the steps below to install fan unit.

(1) Installing additional fan when installing additional processor (CPU).

1. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Pull out thedummy fan.
3. Locate the slot to install an additional fan.
4. Insert the fan unit straight into the additional fan slot until it locks with clicking sound.



Important **Keep the fan cover for future use.**

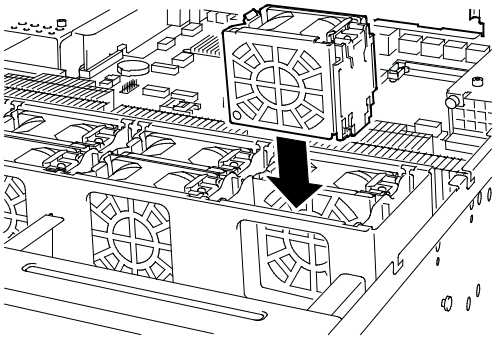
(2) Installing additional fan when configuring redundant fan system.

1. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Locate the slot to install an additional fan.

   With 2.5-inch disk drive model:

   In 1-CPU configuration: Install redundant fan units in slots FAN 1F to 3F, and 5F.
   In 2-CPU configuration: Install redundant fan units in slots FAN 1F to 5F.

3. Insert the fan unit straight into the additional fan slot until it locks with clicking sound.



1.16.2 Replacement or Removal

To remove the redundant fan unit, reverse the installation procedure.

The redundant fan unit can be replaced while the server is powered on (hot swappable).

You can identify the failing fan by using the management tool such as EXPRESSSCOPE Engine 3.

While the system is powered-on or running, the LED of failed fan unit is lit.

CAUTION

Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to *Safety precautions* in *Precautions for Use.*

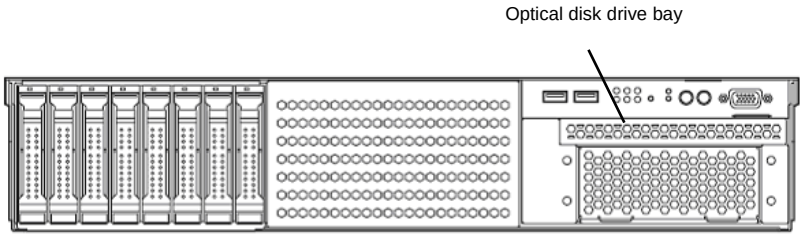
- **Pay attention to electric hazard.**

1.17 Optical Disk Drive

The 16x 2.5-inch drive model supports optical disk drive (option).

This section describes the procedure for installing the optional optical disk drive.

Important **Do not install any unsupported optical disk drive.**

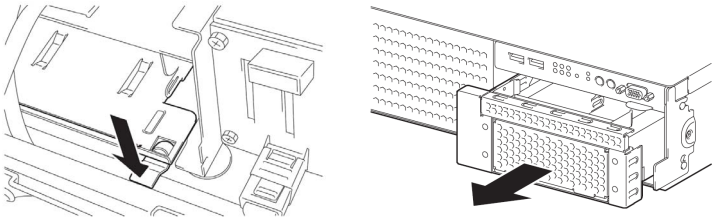


1.17.1 Installation

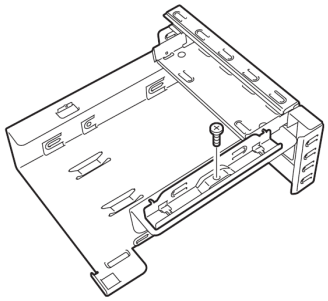
Install an optical disk drive in the following procedure.

1. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations..

2. Lift the lock lever of optical disk drive to unlock the drive tray, and pull the tray toward you.



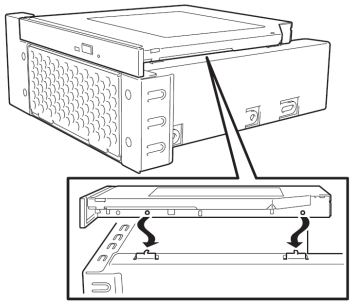
3. Remove a single screw from the tray, and remove the bracket.



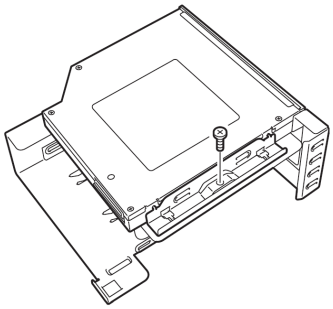
4. Remove the dummy tray.

Important **Keep the screw and dummy tray in the optical disk drive for future use.**

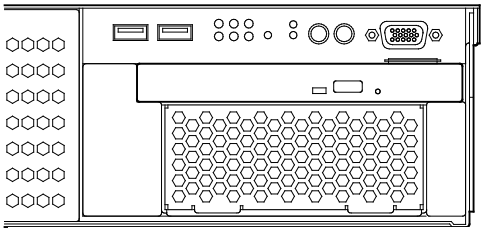
5. Install the optical disk drive.



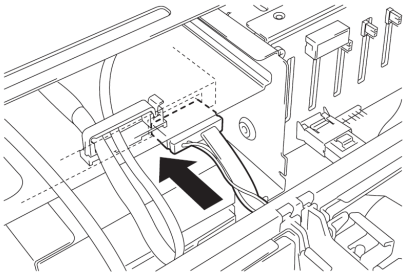
6. Screw the bracket to secure the optical disk drive in place.



7. Insert the optical disk drive and secure the drive tray.



8. Connect the cable to optical disk drive.



1.17.2 Removal

To remove an optical disk drive, reverse the installation procedure above.

1.18 Use of Internal Hard Disk Drives in the RAID System

This section describes how to use the internal Hard Disk Drives in the RAID System.

Important **If you use Hard Disk Drives in the RAID System or change the RAID level, initialize the Hard Disk Drives. If the Hard Disk Drive contains valuable data, be sure to backup the Hard Disk Drive before installing the RAID Controller and configuring the RAID System.**

Note In the RAID System, use Hard Disk Drives that have the same specifications (capacity, rotational speed, and standard) for each Disk Array.

Tips Logical Drives can be created even with only one Physical Device.

(1) If an optional RAID Controller (N8103-149/150/151/160) is used

If using internal Hard Disk Drives in RAID System with an optional RAID Controller (N8103-149/150/151/160) installed in the server, the SATA cable needs to be rewired.

For more information, refer to the manual provided with optional RAID Controller.

Important

- **You must avoid static electricity to work with the procedure below. For details, refer to *Chapter 2 (1.2 Anti-static Measures)*.**
- **Do not change the mode to hibernate when building a RAID System。**

Note

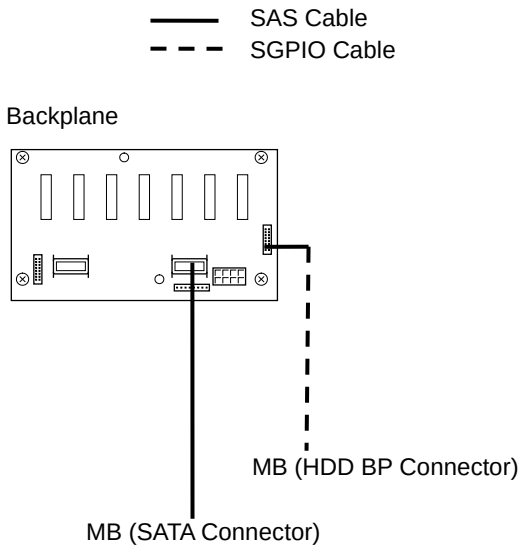
- When installing an optional RAID Controller, start the BIOS Setup utility, select **PCI Configuration** from the **Advanced** menu, and then make sure that the parameter of **PCI Slot *xx* ROM** (*xx* is PCI slot number) is set to **Enabled**.
- When connecting a RAID Controller, set the boot priority to 8th or higher in the Boot menu of the BIOS Setup utility. If the setting is 9th or lower, the configuration menu for RAID Controllers cannot be launched.

Tips When using SAS Hard Disk Drives, RAID Controller must be connected.

1.18.1 Connecting cables

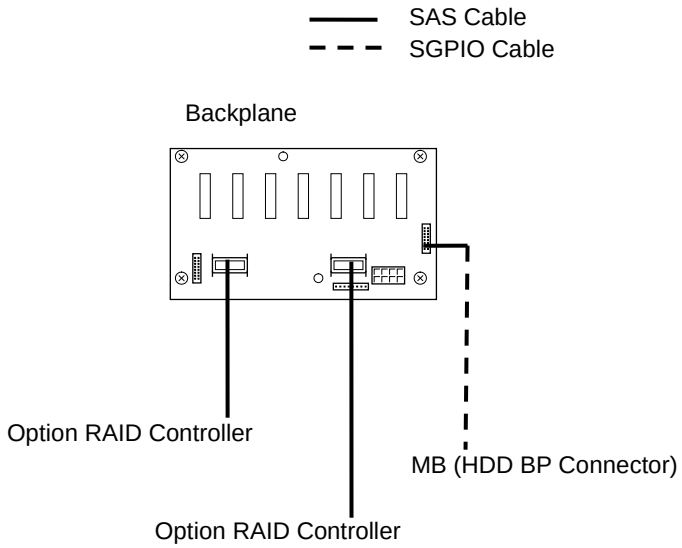
To use an on-board RAID Controller or optional RAID Controller, the interface cable must be connected. Refer to the figures below for how to connect cables.

<16x 2.5-inch drive model : When using onboard RAID controller (1 to 4 drives)>



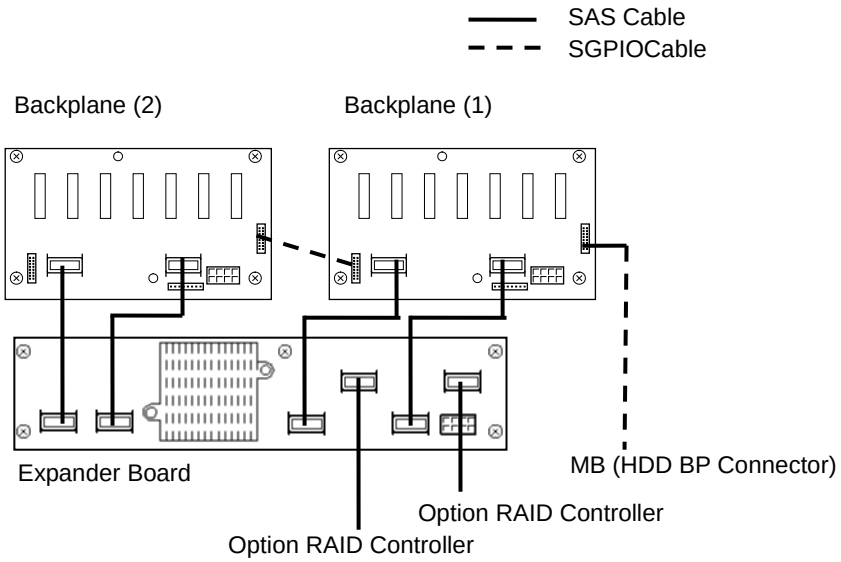
MotherBoard (MB)	BackPlane (BP)	Hard Disk Drive
SATA0_3	SAS0_3	Port 0
		Port 1
		Port 2
		Port 3

<16x 2.5-inch drive model : When using Option RAID controller (1 to 8 drives)>



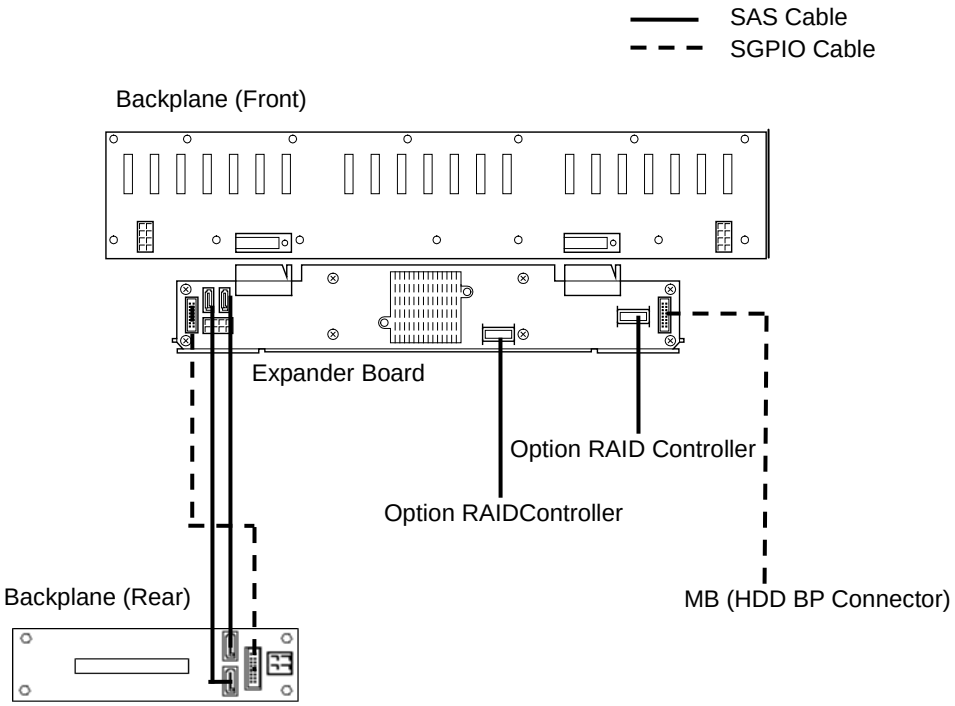
Option RAID Controller	BackPlane(BP)	Hard Disk Drive
SAS 1 (Port 0～3 or Port1～4)	SAS0_3	Port 0
		Port 1
		Port 2
		Port 3
SAS 2 (Port 4～7 or Port5～8)	SAS4_7	Port 4
		Port 5
		Port 6
		Port 7

<16x 2.5-inch drive model : When using Option Raid controller (1 to 16 drives)>



Option RAID Controller	Expander Board		BackPlane	Hard Disk Drive
SAS 1 (Port 0～3 or Port 1～4)	SAS0_3R	SAS0_3H1	BackPlane(1) SAS0_3	Port 0
				Port 1
				Port 2
				Port 3
		SAS4_7H1	BackPlane(1) SAS4_7	Port 4
				Port 5
				Port 6
				Port 7
SAS 2 (Port 4～7 or Port 5～8)	SAS4_7R	SAS0_3H2	BackPlane(2) SAS0_3	Port 8
				Port 9
				Port 10
				Port 11
		SAS4_7H2	BackPlane(2) SAS4_7	Port 12
				Port 13
				Port 14
				Port 15

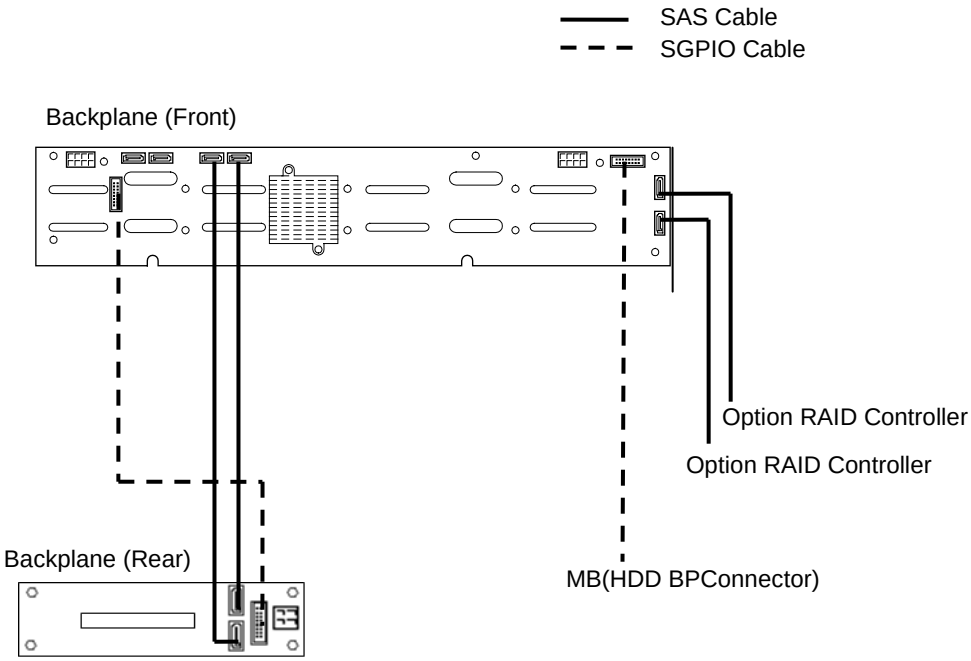
<26x 2.5-inch drive model : When using Option Raid controller (1～26 drives)>



Option RAID Controller	Expander Board	Hard Disk Drive
SAS 1 (Port 0～3 or Port 1～4)	SAS0_3	Port 0～23
SAS 2 (Port 4～7 or Port 5～8)	SAS4_7	

Expander Board	BackPlane(Rear)	Hard Disk Drive
SAS_A	SAS_A	Port 24
SAS_B	SAS_B	Port 25

<3.5-inch drive model : When using Option Raid controller (1 to 14 drives)>



Option RAID Controller	BackPlane	Hard Disk Drive
SAS 1 (Port 0～3 or Port 1～4)	SAS0_3	Port 0～11
SAS 2 (Port 4～7 or Port 5～8)	SAS4_7	

BackPlane (Front)	BackPlane (Rear)	Hard Disk Drive
SAS_A	SAS_A	Port 12
SAS_B	SAS_B	Port 13
SAS_C	No Use	
SAS_D		

1.18.2 Notes on configurating a RAID System

Note the following points when setting up a RAID System.

- The number of Hard Disk Drives required varies in each RAID level.
- If the optional RAID Controller (N8103-149) is used, the RAID System of RAID5/RAID6/RAID50/RAID60 cannot be built.

RAID level	The minimum number of Hard Disk Drives required to set up a RAID System	
	N8103-149	N8103-150/151
RAID 0	1	1
RAID 1	2	2
RAID 5		3
RAID 6		3
RAID 10	4	4
RAID 50		6
RAID60		6

- Use SAS/SATA Hard Disk Drives or SSDs that have the same capacity and rotational speed.
- If you intend to install the OS to the RAID System, the process from RAID configuration to OS installation can be easily completed by using the EXPRESSBUILDER. If you wish to install the OS manually, use a RAID System Configuration utility (WebBIOS or SuperBuild utility). The utility can be run during POST which starts immediately after the server is turned on. For details on the procedure of configuring a Logical Drive, refer to *Chapter 2 (4. RAID System Configuration)* in "*Maintenance Guide*" or the manual supplied with the optional RAID Controller (N8103-149/150/151).

Important

- **Do not change the RAID System mode to hibernate.**
- **Build a Disk Array in the RAID System using Hard Disk Drives that have the same specifications (capacity, rotational speed, and standard).**

1.19 Installing Top Cover

When all internal optional devices including DIMM and PCI card are installed, close the server with Top Cover.

Important **To avoid damage to the cable, connect cables for PCI card such as LAN cable after installing Top Cover.**

1.19.1 Installation

1. Put the top cover straight on the server chassis so that it can be surely engaged with the chassis frame.
2. Slide the top cover toward the front of the server.
3. Tighten thumb nut on the rear panel.

1.20 2.5-inch Hard Disk Drive

Hard disk drive bays are provided at the front or rear of the server as follows:

- 16x 2.5-inch drive model: Front
- 26x 2.5-inch drive model: Front and rear (when rear HDD cage kit added)
- 3.5-inch drive model: Front and rear (2x 2.5-inch disk drive ports when rear HDD cage kit added)

A hard disk drive mounted in a dedicated drive carrier can be purchased. Install the hard disk drive on the server with it mounted in the drive carrier.

Important **Use hard disk drives specified by NEC. Installing a third-party hard disk drive might cause a failure of the server and it.**

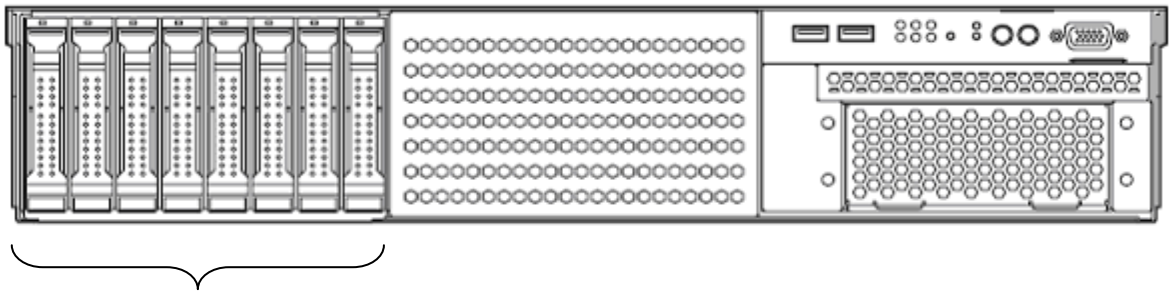
Note the following precautions to install hard disk drives.

- Hard disk drives having different capacities, interface types, or rotational speeds cannot be installed together.
- In the specific RAID System, hard disk drives and solid state drives cannot be installed together.

A unique port number is pre-assigned to each slot.

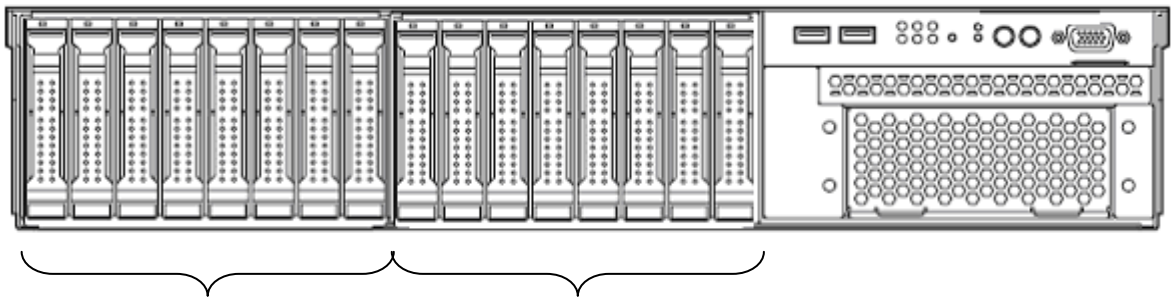
16x 2.5-inch drive model (Front View)

<Standard configuration>



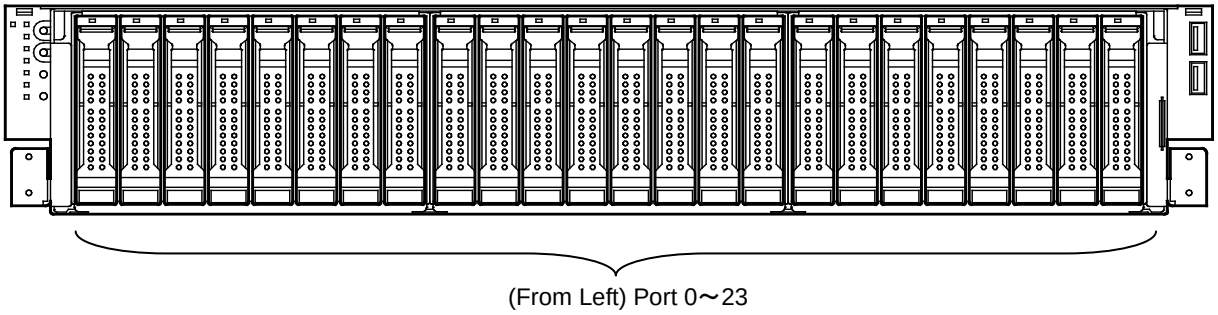
(From Left) Port 0～7

<When 2.5-inch HDD cage added>



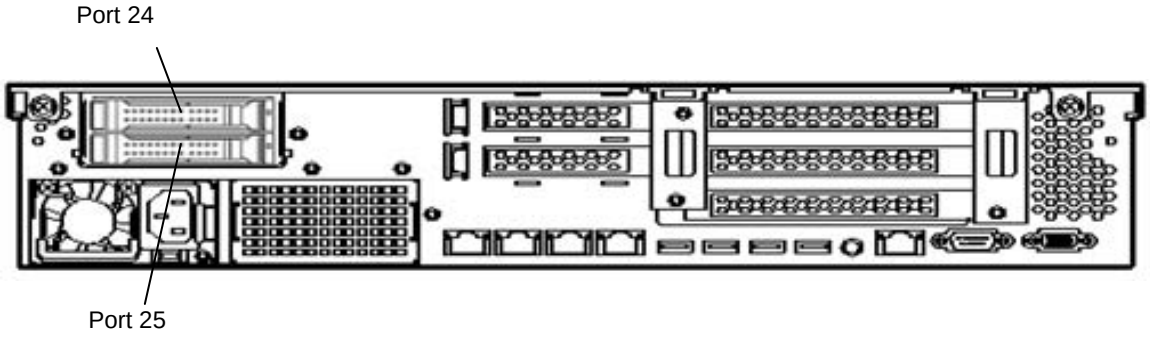
(From Left) Port 0～7 (From Left) Port 8～15

26x 2.5-inch drive model (Front view)



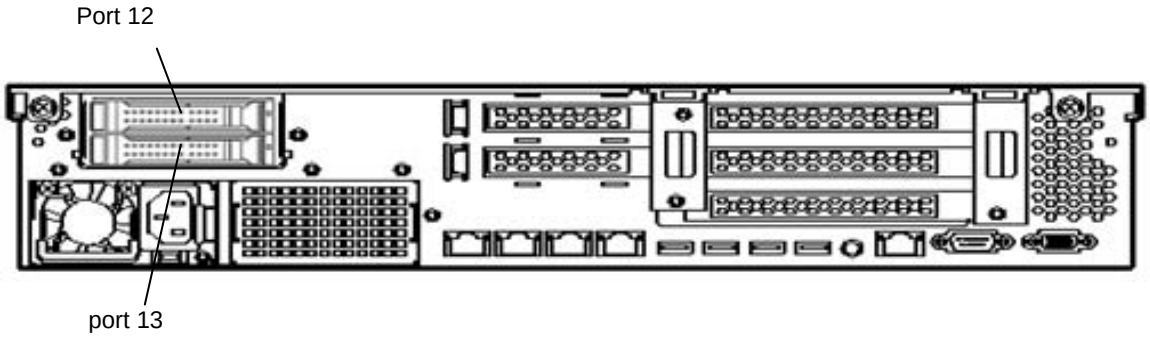
26x 2.5-inch drive model (Rear View)

<When Rear 2.5-inch HDD cage is added>



3.5-inch drive model (Rear View)

< When Rear 2.5-inch HDD cage is added >



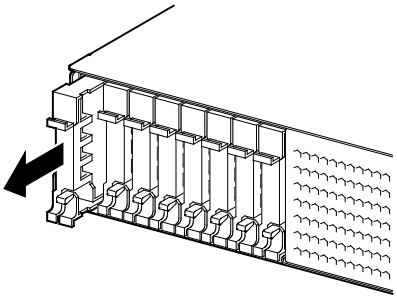
1.20.1 Installation

Install a Hard Disk Drive by using the following procedure. Follow the same installation procedure for other slots.

Important **In the RAID System, build a Disk Array using hard disk drives that have the same specifications (capacity, rotational speed, and standard).**

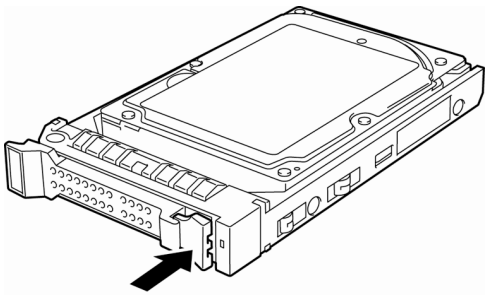
1. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Locate the slot where you are going to install the Hard Disk Drive.

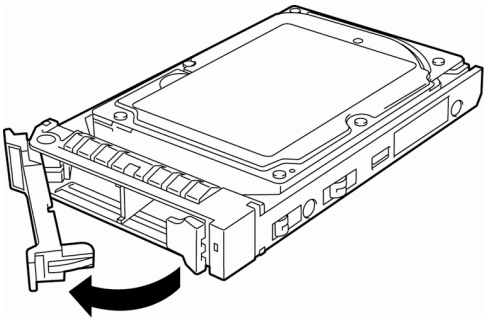
   Install Hard Disk Drives in ascending port number order.
3. Remove the dummy trays.



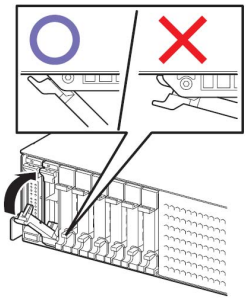
Important
- **Keep the dummy trays for future use.**
- **Dummy trays are intended to increase the cooling effect inside the server. Keep the dummy trays installed in slots where Hard Disk Drives are not installed.**

4. Unlock the handle of the drive carrier.





5. Hold the drive carrier firmly and insert it into the slot.



Note

- Push it all the way until the handle's lock touches the frame.
- Hold the drive carrier firmly with both hands.

6. Slowly close the handle.

   The drive carrier is locked making a clicking sound.

Note

When you push the drive into the slot, confirm the handle got hooked on the frame.

7. Turn on the server, run BIOS SETUP utility, and then specify the boot order from the **Boot** menu. For details about the **Boot** menu, refer to *Chapter 2 (1.2.5 Boot)* in "*Maintenance Guide*".

   This process is required because the saved boot order is cleared when you add a Hard Disk Drive.

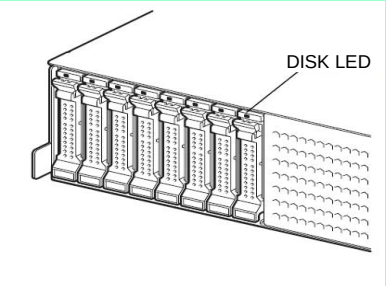
1.20.2 Removal

Remove a Hard Disk Drive, reverse the installation procedure.

If you transfer or dispose of the removed hard disk drive, refer to *Chapter 1 (1. Transfer, Movement, and Disposal) in "Maintenance Guide"* to erase data.

Important **NEC assumes no liability for data leakage should the product be transferred to a third party without erasing the data.**

Note If you have to remove a disk due to a hard disk drive failure, check the slot with its DISK LED lit in amber.



Note Do not pull the handle to remove the hard disk drive.
Doing so may damage the handle.

Run SETUP utility, and then specify the boot order from the **Boot** menu. For details about the **Boot** menu, refer to *Chapter 2 (1. System BIOS)* in "*Maintenance Guide*".

Tips The saved boot order is cleared when a hard disk drive is removed.

1.20.3 Replacing a Hard Disk Drive in the RAID System

In the RAID System, you can use the auto rebuild feature to restore data back to the state before a failure occurred by writing the data saved before the replacement to a new Hard Disk Drive after replacing the broken Hard Disk Drive.

The auto rebuild feature is enabled in logic drives set to RAID 1, RAID 5, RAID 6, RAID 10, RAID 50, and RAID60.

The disk is automatically rebuilt when hot swapping (replacing a disk while the power on) a failed Hard Disk Drive.

During the auto rebuild, the DISK LED on the Hard Disk Drive flashes green and amber alternately to indicate that the autorebuild is being performed.

Observe the following precautions whenever executing the auto rebuild

- Do not turn off the server until the auto build completes after a Hard Disk Drive fails.
- Leave an interval of at least 90 seconds between a Hard Disk Drive removal and a Hard Disk Drive installation.
- Do not replace a disk during the auto rebuilding of another Hard Disk Drive (during an auto rebuild, the DISK LED on the Hard Disk Drive flashes green and amber alternately).

1.21 3.5-inch Hard Disk Drive

3.5-inch hard disk drive bays are provided at the front of the server.

A hard disk drive mounted in a dedicated drive carrier can be purchased. Install the hard disk drive on the server with it mounted in the drive carrier.

Important **Use hard disk drives specified by NEC. Installing a third-party hard disk drive might cause a failure of the server and it.**

Note the following precautions to install hard disk drives.

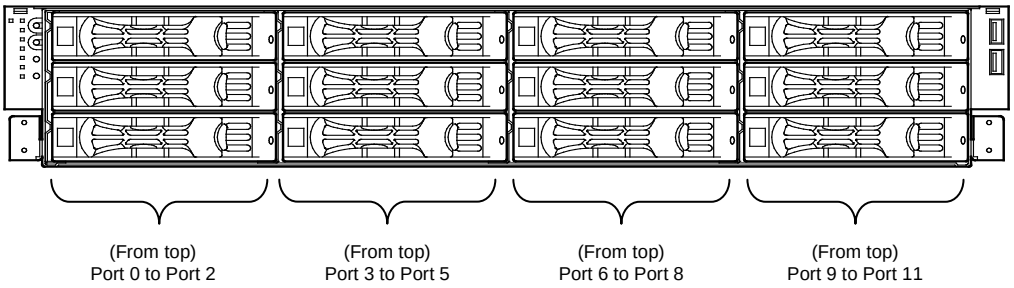
- For onboard connection, hard disk drives having different capacities, interface types, or rotational speeds cannot be installed together.
- In the specific RAID System, hard disk drives and solid state drives cannot be installed together.

Bays can contain up to 12 hard disk drives .

A unique port number is pre-assigned to each slot.

3.5-inch drive model (Front View)

<Standard configuration>



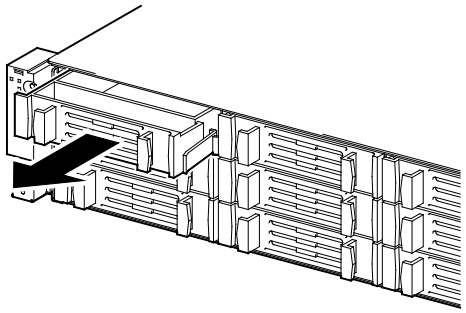
1.21.1 Installation

Install a Hard Disk Drive by using the following procedure. Follow the same installation procedure for other slots.

Note

Use hard disk drives specified by NEC. Installing a third-party hard disk drive might cause a failure of the server and it.

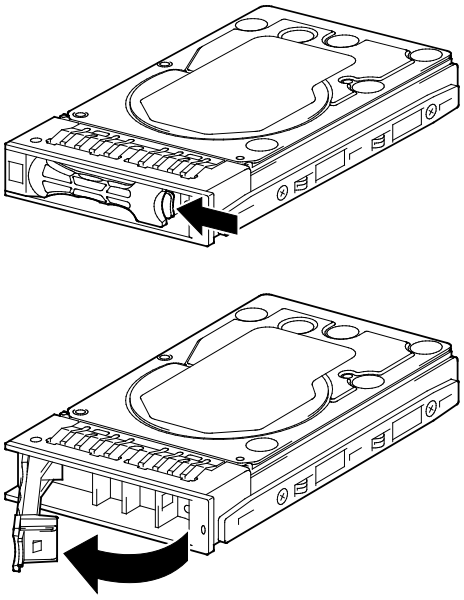
1. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Locate the slot where you install the Hard Disk Drive.
   The server provides 12 slots. Install Hard Disk Drives in ascending port number order.
3. Remove the dummy trays.



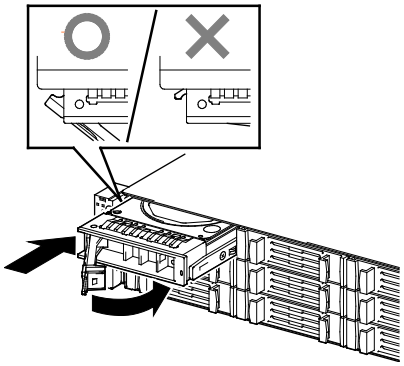
Note

- Keep the dummy trays for future use.
- Dummy trays are intended to increase the cooling effect inside the server. Keep the dummy trays installed in slots where Hard Disk Drives are not installed.

4. Unlock the handle of the drive carrier.



5. Hold the drive carrier firmly and insert it into the slot.



Note

- Push it all the way until the handle's lock touches the frame.
- Hold the drive carrier firmly with both hands.

6. Slowly close the handle.
The drive carrier is locked making a clicking sound.

Note

When you push the drive into the slot, confirm the handle got hooked on the frame.

7. Turn on the server, run SETUP utility, and then specify the boot order from the **Boot** menu. For details about the **Boot** menu, refer to *Chapter 2 (1.2.5 Boot)* in "*Maintenance Guide*".

Tips

The saved boot order is cleared when a hard disk drive is added.

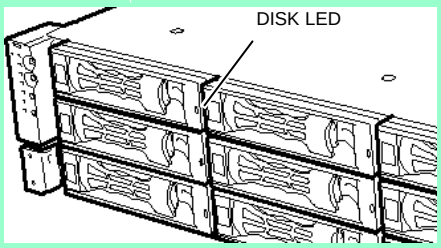
1.21.2 Removal

Remove a Hard Disk Drive, reverse the installation procedure.

If you transfer or dispose of the removed hard disk drive, refer to *Chapter 1 (1. Transfer, Movement, and Disposal) in "Maintenance Guide"* to erase data.

Important **NEC assumes no liability for data leakage should the product be transferred to a third party without erasing the data.**

Note If you have to remove a disk due to a hard disk drive failure, check the slot with its DISK LED lit in amber.



Note Do not pull the handle to remove the hard disk drive.
Doing so may damage the handle.

Run SETUP utility, and then specify the boot order from the **Boot** menu. For details about the **Boot** menu, refer to *Chapter 2 (1. System BIOS)* in "*Maintenance Guide*".

Tips The saved boot order is cleared when a hard disk drive is added.

1.21.3 Replacing a Hard Disk Drive in the RAID System

In the RAID System, you can use the auto rebuild feature to restore data back to the state before a failure occurred by writing the data saved before the replacement to a new Hard Disk Drive after replacing the broken Hard Disk Drive.

The auto rebuild feature is enabled in logic drives set to RAID 1, RAID 5, RAID 6, RAID 10, RAID 50, and RAID60.

The disk is automatically rebuilt when hot swapping (replacing a disk while the power on) a failed Hard Disk Drive.

During the auto rebuild, the DISK LED on the Hard Disk Drive flashes green and amber alternately to indicate that the autorebuild is being performed.

Observe the following precautions whenever executing the auto rebuild

- Do not turn off the server until the auto build completes after a Hard Disk Drive fails.
- Leave an interval of at least 90 seconds between a Hard Disk Drive removal and a Hard Disk Drive installation.
- Do not replace a disk during the auto rebuilding of another Hard Disk Drive (during an auto rebuild, the DISK LED on the Hard Disk Drive flashes green and amber alternately).

1.22 Power Supply Unit

Your server can contain two power supply unit (one is factory-installed, and another is optional). The server equipped with two hot-swap power supply units provides a redundant power configuration that ensures continued operation of the system in the unlikely event one of the power supply units fails.

You can select a power supply unit appropriate your system configuration. See the table below.

Model (Installed CPU)	Number of CPUs	Additional HDD cage	Available power supply unit
16x 2.5-inch hard disk drive model	1 CPU	Not installed	450/800 W
		Installed	800 W
	2 CPUs	–	800 W
26x 2.5-inch hard disk drive model	–	–	800 W
3.5-inch hard disk drive model			

1.22.1 Cold Redundant Feature

The server supports the feature to optimize power efficiency as described below:

- Cold redundant feature can run the system with optimum power efficiency by raising operating efficiency of primary power supply unit and lowering that of redundant power supply unit in redundant power configuration.
- If power efficiency of power units is not optimized due to system configuration, this feature is disabled automaticlly.

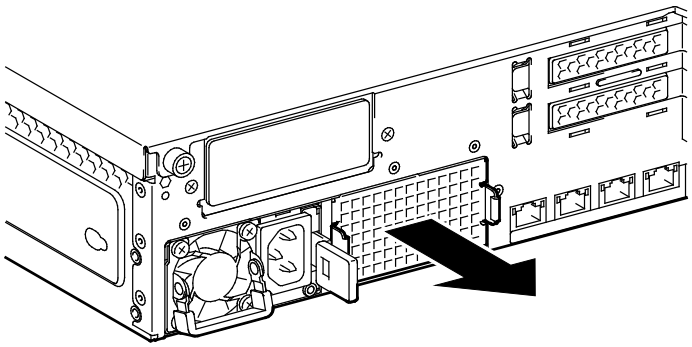
Cold redundant feature can be used under the following conditions:

- Two power supply units must be installed for redundant configuration.
- Refer to *Chapter 2 (1. System BIOS) in "Maintenance Guide"*, change parameters as shown below, save the settings and exit from SETUP.
  Server → **Power Control Configuration** → **Cold Redundant Mode** → **Enabled**
  Run SETUP again, and check if the status of **Cold Redundant Mode** shows **Enabled** in **Server** menu.

1.22.2 Installation

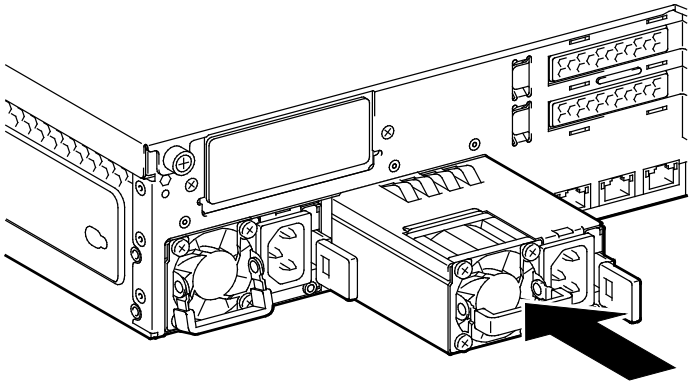
Follow steps below to install a power supply unit:

1. Refer to steps 1 to 4 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Remove the blank cover.



Important **Keep the removed blank cover for future use.**

3. Insert the power supply unit.until it is locked with clicking sound.

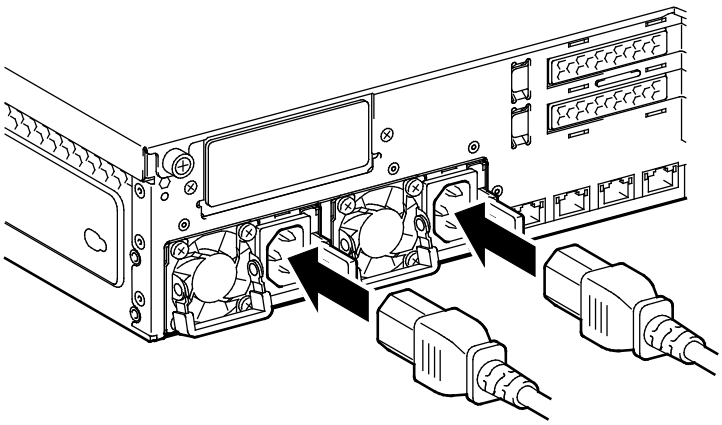


4. Connect power cords.

   Use the specified power cord.

   The AC POWER LEDs blink green when the power cord is connected to either one of power supply units. The AC POWER LEDs on another power supply unit goes on amber.

   When the power cords are connected, AC POWER LEDs on both power supply units blink green.



5. Power on the server.

   The AC POWER LEDs go on green.

6. Confirm, by the STATUS LED or on the POST screen, that there are no errors related to the power supply units.

   Refer to *Chapter 2 (5. Troubleshooting)* of the Maintenance Guide for details on the error messages.

   If the AC POWER LEDs are off, reinstall the power supply units. If the same error message still appears, contact your service representative.

1.22.3 Replacing a Failing Power Supply Unit

Replace only when the power supply unit fails.

CAUTION

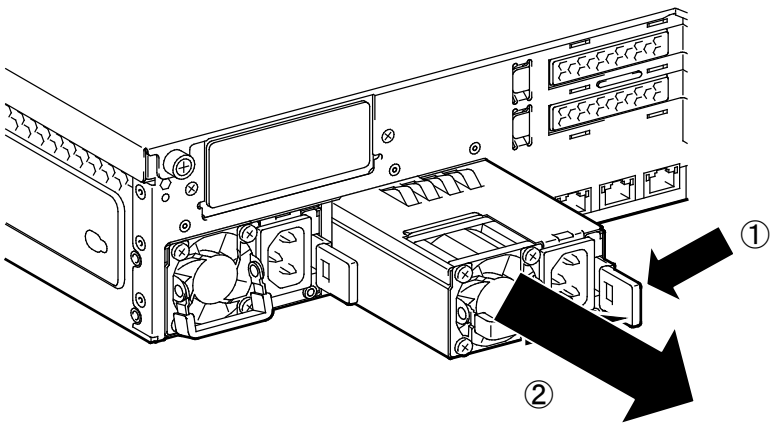
Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to *Safety precautions* in *Precautions for Use.*

- **Pay attention to electric hazard.**

Important **Do not remove a power supply unit operating normally.**

Tips In the redundant power configuration (with two power supply units) and if either one of power supply units fails, the failing power supply unit can be replaced with the system power on. (Skip steps 1 and 2 below).

1. Locate the failing power supply unit by the AC POWER LED on the rear of each power supply unit. (The LED of the failing power supply unit is lit amber or blinking amber.)
2. Shutdown the system, and press the POWER switch on the server to turn off the power.
3. Disconnect the AC power cord from the failed power supply unit.
4. Push the lever of the failing power supply unit toward inside, and pull the power supply unit while holding the handle.Remove the power supply unit from the chassis.



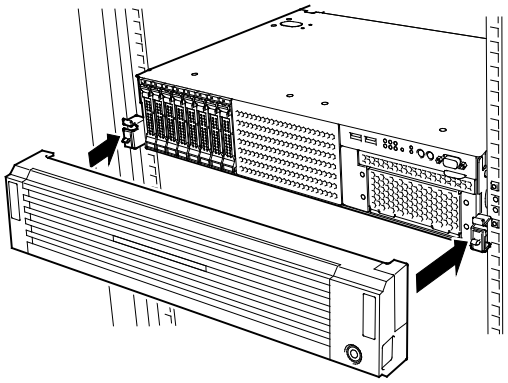
5. If operating the server with a single power supply unit without installing a new one, install the blank cover you removed in step 2 of installation procedure.

Important **To maintain the cooling effect in the server, install the blank cover in the vacant slot.**

6. Install the new power supply unit taking steps 3 to 7 of "*Installation*", and confirm that the power supply unit is installed normally.

1.23 Installing Front Bezel

When installing Front Bezel, engage catches of front bezel with those on mounting ear.
After installing Front Bezel, lock it with Bezel Lock Key.



Important **Be careful not to press POWER Switch.**

2. Installation and Connection

This section describes how to position the server and connect cables.

2.1 Installation

This server must be mounted to a rack which conforms to EIA standards for use.

2.1.1 Installing Rack

WARNING

Be sure to observe the following precautions to use the server safety. Failure to observe the precautions may cause death or serious injury. For details, refer to *Safety precautions* in *Precautions for Use*.

- **Use only in the specified environment.**
- **Do not connect the ground wire to a gas pipe.**

CAUTION

Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to *Safety precautions* in *Precautions for Use.*

- **Do not carry or install the server only by a single person.**
- **Do not install the server so that the load may be concentrated on a specific point.**
- **Do not install any components only by a single person. Confirm that hinge pins of the door are completely secured in place.**
- **Do not pull out the server from the rack when the rack is unstable.**
- **Do not leave more than one device being pulled out from the rack.**
- **Do not provide the wiring for the server to exceed the rating of the power supply.**
- **Do not use in the environment where corrosive gas is generated.**

Do not install the rack or server under the following environment. Doing so may cause malfunction of the server.

- Narrow space from which devices cannot be pulled out from the rack completely
- Place that cannot bear the total weights of the rack and devices mounted on the rack
- Place where stabilizers cannot be installed or where the rack can be installed only after the practice of proper earthquake-resistant construction
- Place of uneven or slanting floor
- Place of drastic temperature change (near a heater, air conditioner, or refrigerator)
- Place where intense vibration may be generated
- Place where corrosive gases (sulfur dioxide, hydrogen sulfide, nitrogen dioxide, chlorine, ammonia, ozone, etc) exist
  Place where the air (or dust) includes components accelerating corrosion (ex. sulfur, sodium chloride) or conductive metals
- Place where chemicals may be accidentally sprayed over
- Place where a carpet not subject to anti-static process is laid
- Place where some objects may be fallen on the rack
- Place near a device generating intense magnetic field (such as TVs, radios, broadcast/communication antennas, power transmission wires, and electromagnetic cranes) is placed (If unavoidable, contact your maintenance service company for proper shield construction.)
- Place where the power cord of the server must be connected to an AC outlet that shares the outlet of another device with large power consumption
- Place near equipment that generates power noise (e.g., contact spark at power-on/power-off of commercial power supply through a relay). If you must install the server close to such equipment, have your maintenance service company separate power cables or install noise filter.
- Environment where operation of the server is not guaranteed

2.1.2 Installing the server to the rack or removing it from the rack

Mount the server to the rack. (This section also describes the removal procedure.)

WARNING

Be sure to observe the following precautions to use the server safety. Failure to observe the precautions may cause death or serious injury. For details, refer to *Safety precautions* in *Precautions for Use*.

- **Do not use any racks out of standards.**
- **Use only under the specified environment.**

CAUTION

Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to *Safety precautions* in *Precautions for Use.*

- **Do not drop.**
- **Do not leave the server being pulled out.**
- **Do not install with the cover removed.**
- **Do not get your fingers caught.**

Important

Temperature increases and airflow in the rack

If multiple devices are installed, or if the inside of the rack is not sufficiently ventilated, the internal temperature rises due to the heat emitted from each device, which may result in a malfunction. Review airflow in the rack and room and take sufficient measures so that the internal temperature will not exceed the operational temperature during operation.
Air enters the server from the front and exits from the rear.

(1) Installation

This server can be mounted to a rack made by NEC or other companies. Mount the server to a rack in the following procedure.

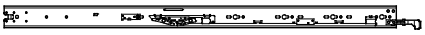
Preparation for mounting

- Checking rails
- Installing inner and outer rails

Important **Rail for left side has different shape from that for right side. Make sure the orientation of rails to properly install them.**

Checking inner rails

Make sure the orientation of inner rails.



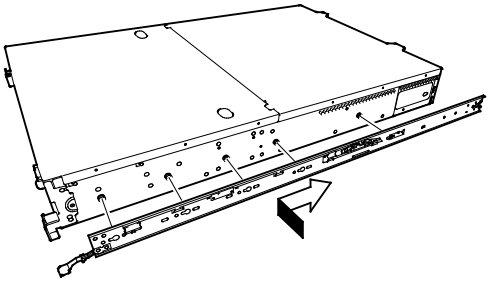
Inner rail (L)

Inner rail (R)

Installing inner rails

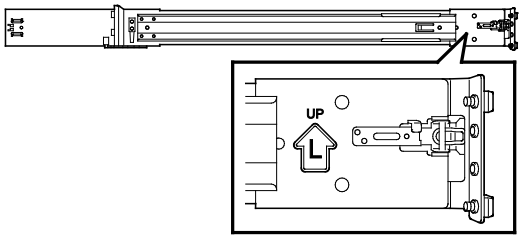
Mount an inner rail marked as "R" to the right side of the server and "L" to the left side when viewed the server from front.

Align inner rail with three protrusions on side of server chassis, and slide the inner rail toward rear of the server.
Make sure the lock at around the center of inner rail clicks to indicate the rail is surely locked.
Install another inner rail to opposite side in similar way.

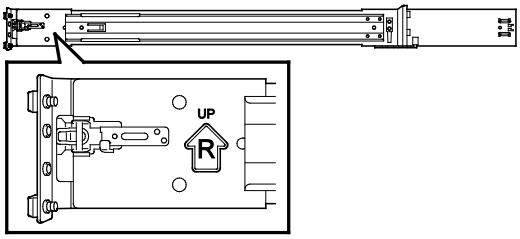


Checking outer rails

Make sure the orientation of outer rails by viewing "L" or "R" marked on rail.



Outer rail (L)



Outer rail (R)

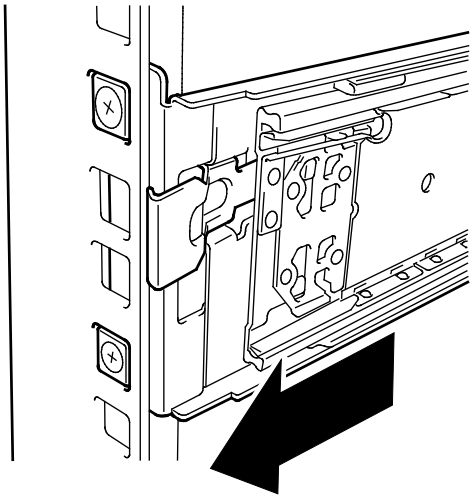
Installing outer rails

Attach the rail assemblies you previously removed.

Fit the square-shaped protrusions of the rail assembly to the square holes of a 19-inch rack. Make sure that it makes a clicking sound indicating that it is locked.

The image on the right shows the front right side (front) of the rack. Install to the rear right side and front and rear left sides following the same procedure.

Make sure that the rail assembly is installed at the same height as the other slide rail assemblies already installed.



Important **Confirm that the rail assemblies are securely locked so that they will not fall off.**

Tips Although the rail assembly may be somewhat unsteady, it is not defective.

Installing the Server

⚠ CAUTION

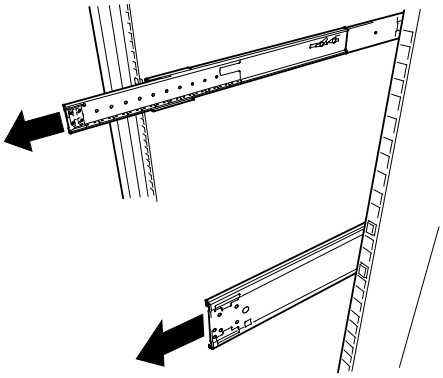
Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to *Safety precautions* in *Precautions for Use.*

- **Do not attempt to lift the server with a single person.**
- **Do not drop.**
- **Do not leave the server being pulled out.**
- **Do not install with the cover removed.**
- **Do not get your fingers caught.**

(2) Installation procedure

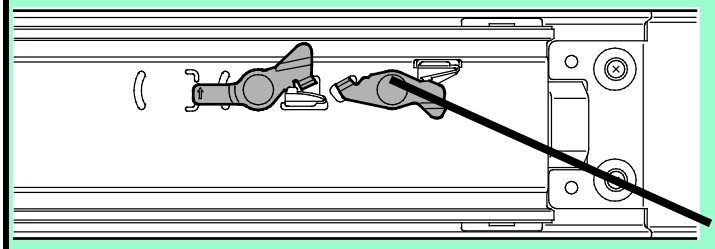
Mount the server to a rack in the following procedure. Always install the server with two or more persons.

1. Pull the slide rails from left and right outer rails until they are locked.

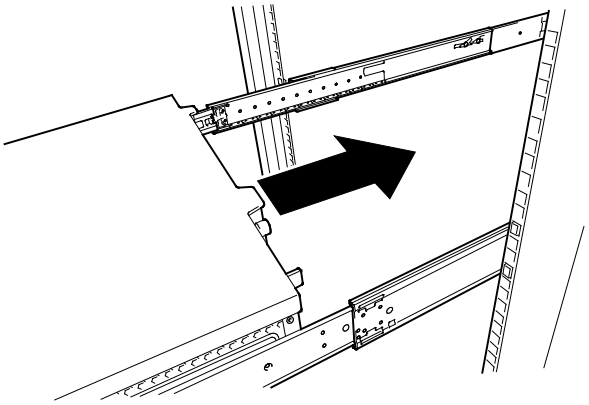


Note

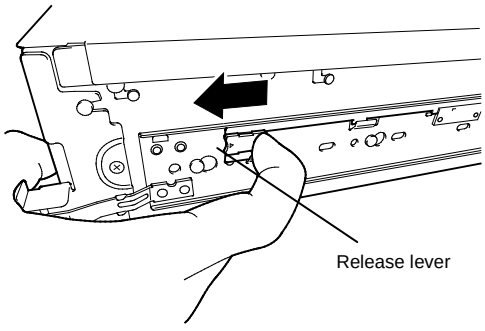
Make sure that locking mechanism work normally.



2. With two or more persons, firmly hold the server and mount it to the rack.



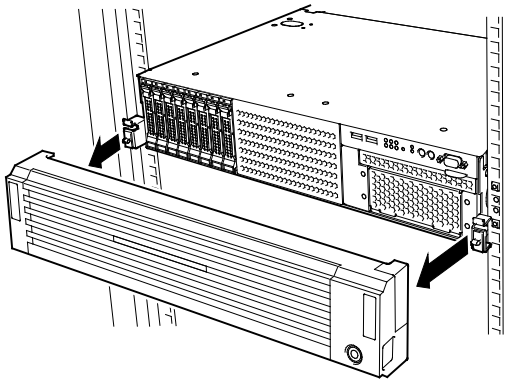
3. When the server is pushed into the rack and is locked, push the server to the end while pulling the release levers (blue) on both sides of the server.
4. Push the server until its lock on front panel clicks.



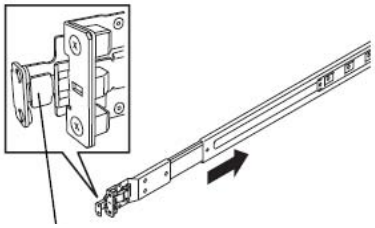
(3) Removal procedure

Remove the server from the rack in the following procedure. At least two persons are required to remove the server from rack.

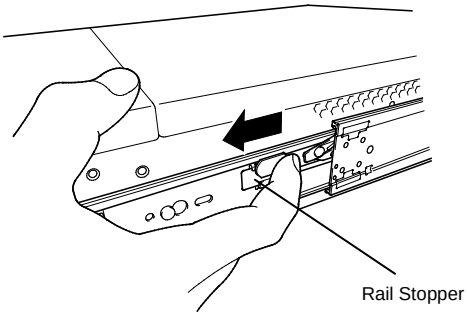
1. Make sure that the server is turned off and then disconnect the power cord or all interface cables from the server.
2. Unlock the security lock to remove the front bezel



3. Slowly pull the server out while pressing the unlock buttons located on either side of the front of the server.



4. Because there are stoppers, the server will come to a stop halfway. Press and hold the release levers on the rails and pull the server out of the rack.



Important **Be careful not to get your fingers caught in the rails and levers.**

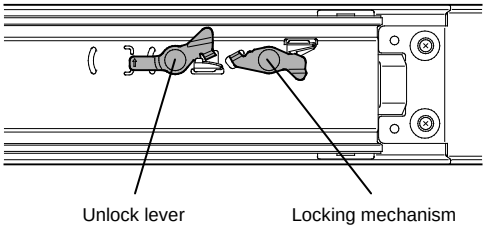
5. Hold the server firmly and remove it from the rack.

Important
- **While more than one person is supporting the bottom part of the server, slowly pull out the server.**
- **Do not apply pressure on the server from top when it is being pulled out. Doing so cause the server to drop, which is dangerous.**
- **Be careful not to get your finger caught in rails.**

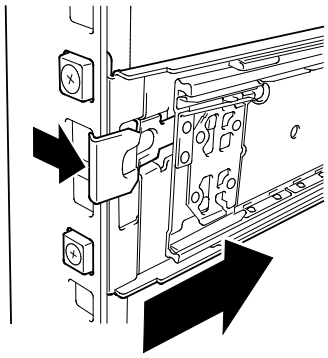
(4) Removing rail assemblies

Remove the rail assemblies from the rack by using the following procedure.

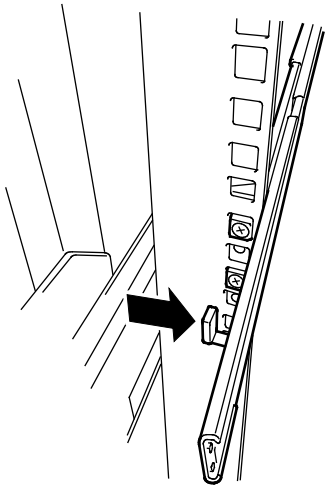
1. Refer to *Chapter 2 (2.1.2) - (3) Removal procedure* to remove the server from the rack.
2. Push the unlock lever on outer rail to the direction shown by arrow to house the slide rail.



3. While pressing the lever on outer rail, push the outer rail toward inside of the rack, then remove it.



Front View



Rear view

2.2 Connection

Connect peripheral devices to the server.

Connectors that allow a variety of peripheral devices to be connected are provided at the front and rear of the server. Images on the following pages show the peripheral devices that can be connected in their standard state and their respective connector positions. First connect the peripheral devices and then connect the power cord to the server. After that, connect the power plug to the outlet.

WARNING

Be sure to observe the following precautions to use the server safety. Failure to observe the precautions may cause death or serious injury. For details, refer to *Safety precautions* in *Precautions for Use*.

- **Do not hold the power plug with wet hands**
- **Do not connect the ground wire to a gas pipe**

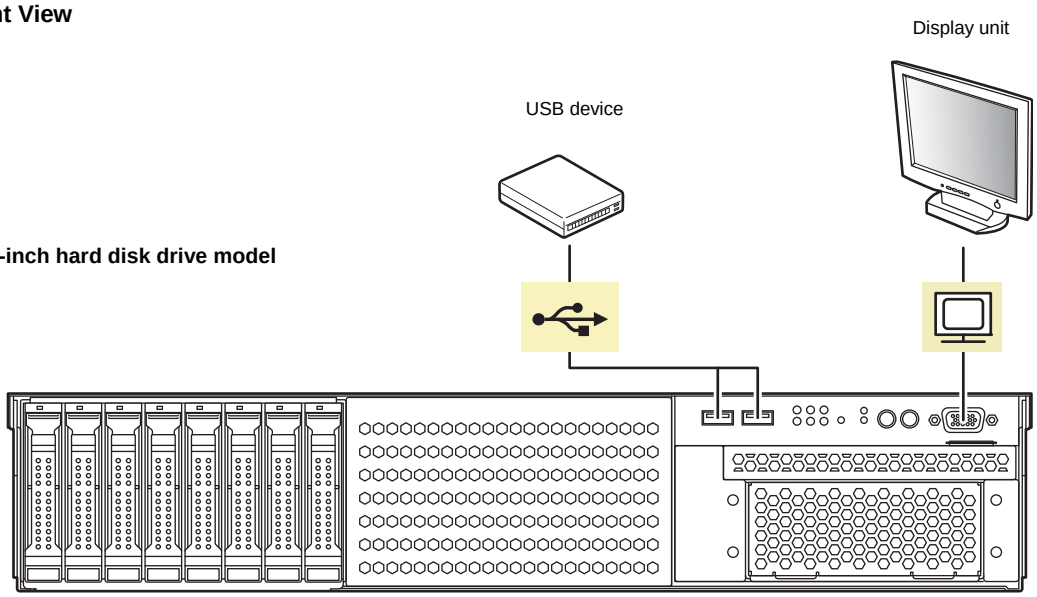
CAUTION

Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to *Safety precautions* in *Precautions for Use.*

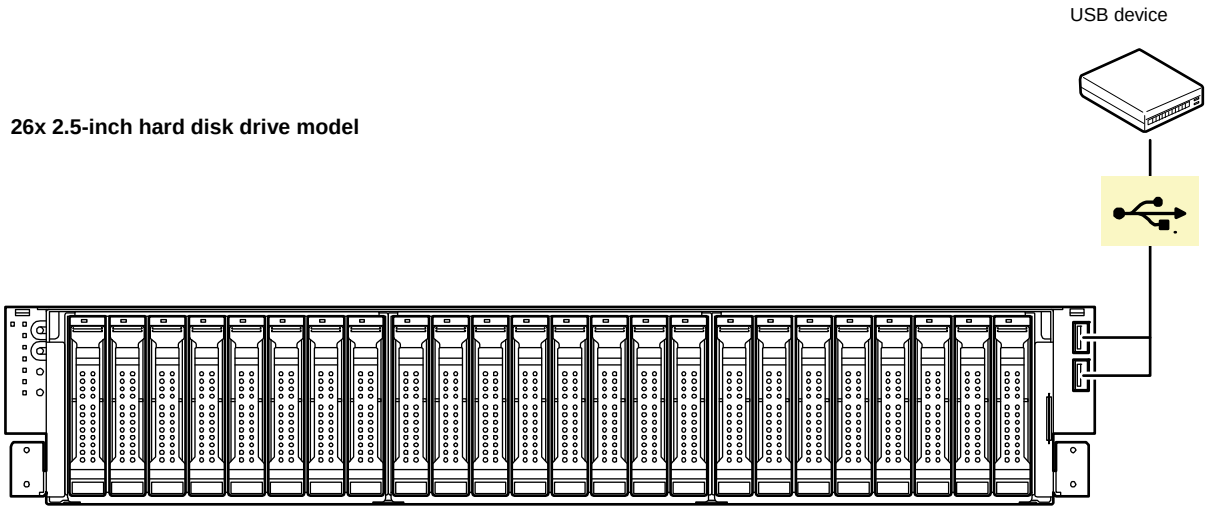
- **Use only the specified outlet to insert.**
- **Do not connect the power cord to an outlet that has an illegal number of connections.**
- **Insert the power plug into the outlet as far as it goes.**
- **Use only the specified power cord**
- **Do not connect or disconnect the interface cable with the power plugged in the outlet.**
- **Use only the specified interface cable**

(1) Front View

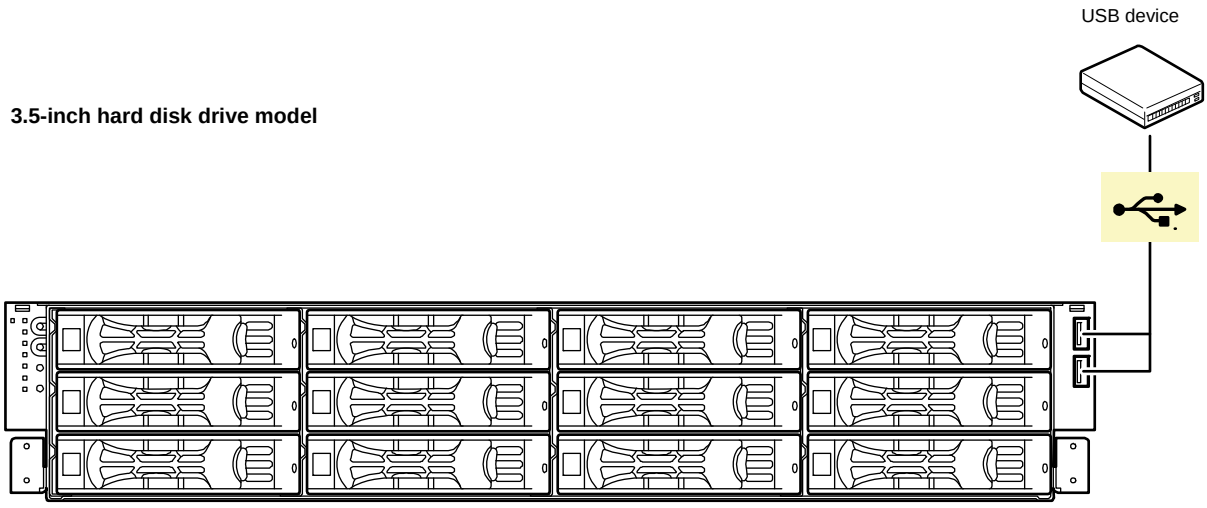
16x 2.5-inch hard disk drive model



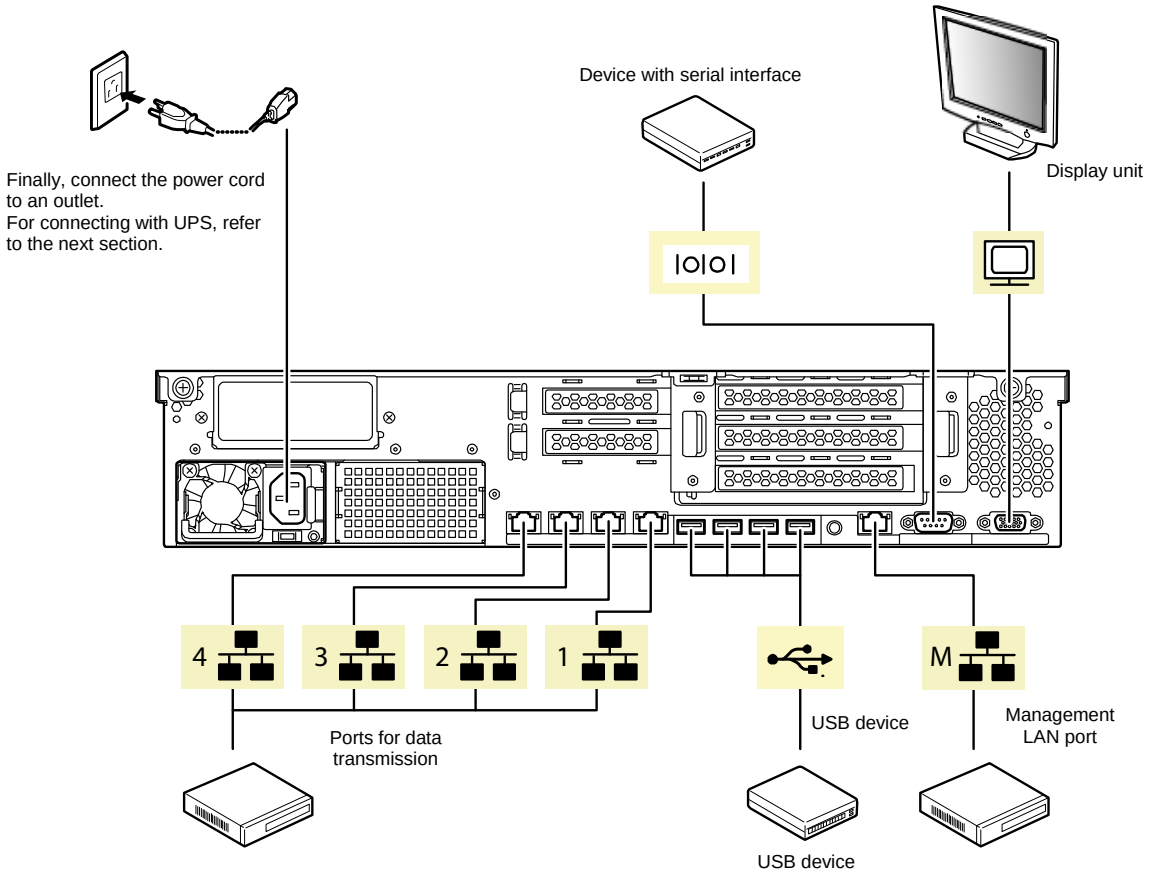
26x 2.5-inch hard disk drive model



3.5-inch hard disk drive model

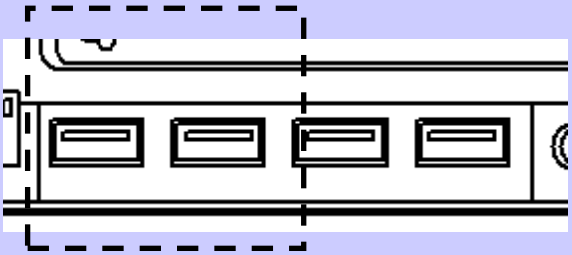


(2) Rear View


Finally, connect the power cord to an outlet.
For connecting with UPS, refer to the next section.
Device with serial interface
Display unit
4
3
2
1
M
Ports for data transmission
USB device
Management LAN port
USB device

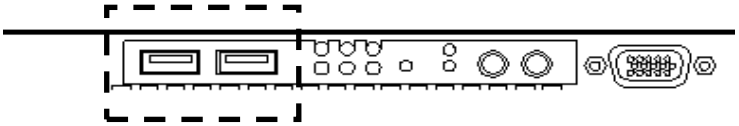
Tips

- A dedicated line cannot be directly connected to the serial port connector.
- 2 ports USB connectors at the rear of the server are supplied with power even when DC power is off.

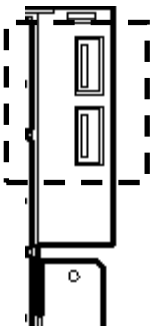


Note the following precautions to connect cables.

- When the device is not Plug and Play device, turn off the server and devices before connecting.
- If connecting any peripheral device and its interface cable made by other companies (a third party), contact your sales representative to check if they can be used with the server beforehand.
- Fix the power cord or interface cable with cable ties.
- Make sure that no pressure is applied on the plug of power cord.
- If you connect an external USB DVD-ROM drive to a USB connector at the front of the server, do not connect any other device to the adjacent USB port. See the figure below.



16x 2.5-inch drive model

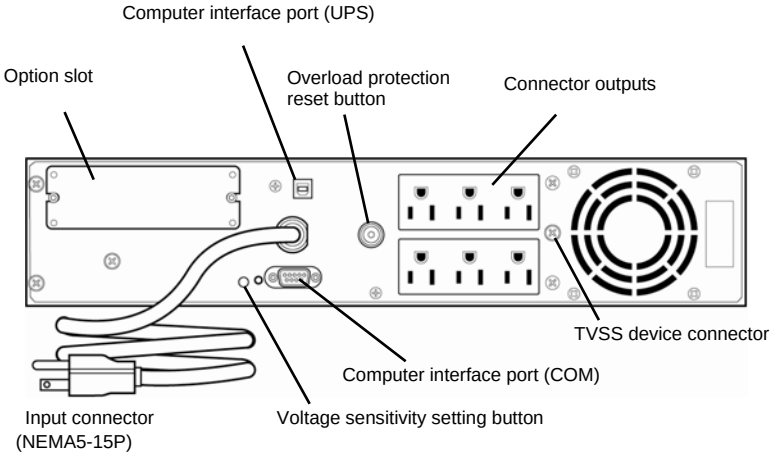


26x 2.5-inch drive model, 3.5-inch drive model

2.2.1 Connecting to a uninterruptible power supply (UPS)

To connect the power cord of the server to the uninterruptible power supply (UPS), use the connector output on the rear of the UPS. For details, refer to the manual supplied with the UPS.

Example



When the power cord is connected to a UPS, the BIOS settings may need to be changed in order to link the server with the power supply from the UPS.

To change the settings, select **Server** and then **AC-LINK** in the BIOS setup utility, and change the displayed parameters. Select **Power On** to perform automatic operations by using the UPS. For details, refer to *Chapter 2 (1.2.4 Server)* in "*Maintenance Guide*".

NEC Express5800 Series
Express5800/R120d-2E

3 Setup

This chapter describes how to set up the server.

1. **Turning on the Server**
   POST (Power-On Self-Test) is explained in this section.

2. **System BIOS Setup**
   You can customize the BIOS settings by following the instructions in this section.

3. **EXPRESSSCOPE Engine 3**
   EXPRESSSCOPE Engine 3 provides useful features through the Baseboard Management Controller (BMC).

4. **EXPRESSBUILDER**
   EXPRESSBUILDER helps you to install Windows and maintain the server.

5. **Installing Software Components**
   You can install Windows and bundled software by following the instructions in "*Installation Guide (Windows)*".

6. **Turning off the Server**
   Turn off power when not using the server.

1. Turning on the Server

Pressing the POWER switch at the front of the server turns on the server.

Turn on the server by using the following procedure.

Tips Wait for at least 40 seconds before turning on the server after connecting the power cord. (Do not power on the server before amber POWER LED is unlit.)

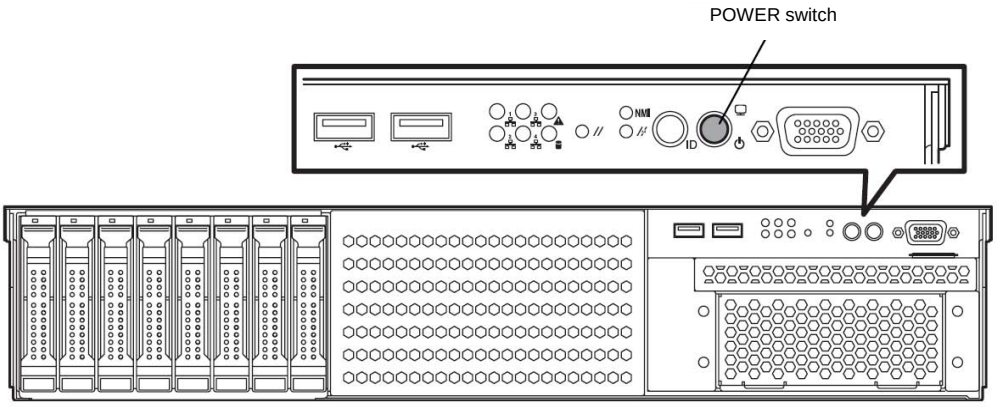
1. Turn on the peripheral devices and the display unit.

Note If the power cord is connected to power control system such as an Uninterruptible Power Supply (UPS), make sure that the power control system is turned on.

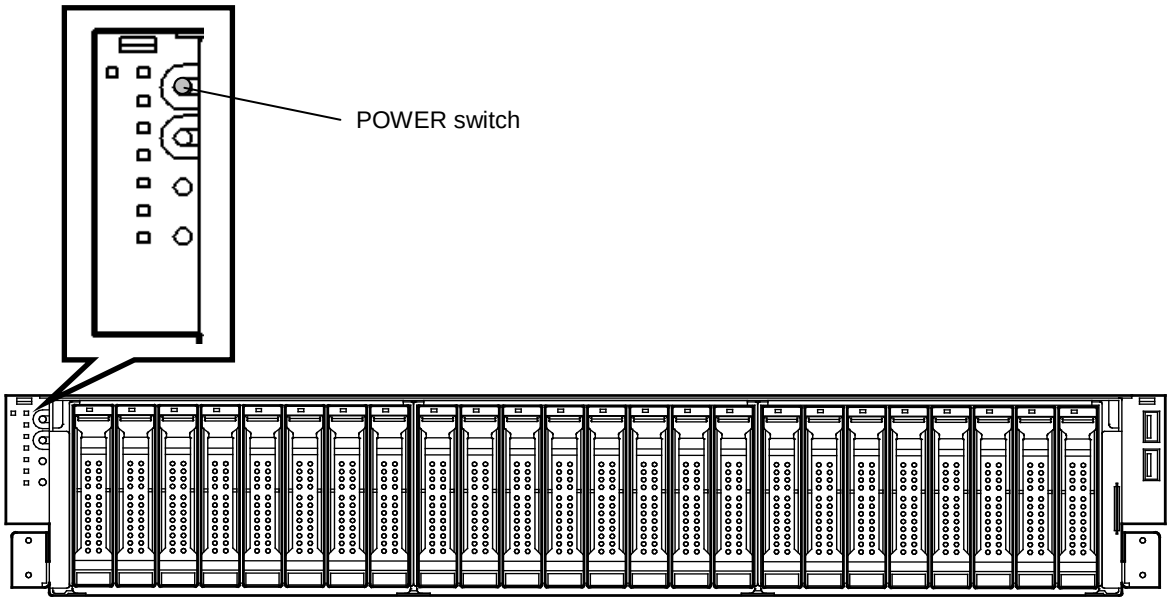
2. Remove the front bezel (Option).
3. Press the POWER switch at the front of the server.
   The POWER LED is turned on green and after a while, the logo appears on the display.

Important **Do not connect or disconnect USB device while POST is running.**

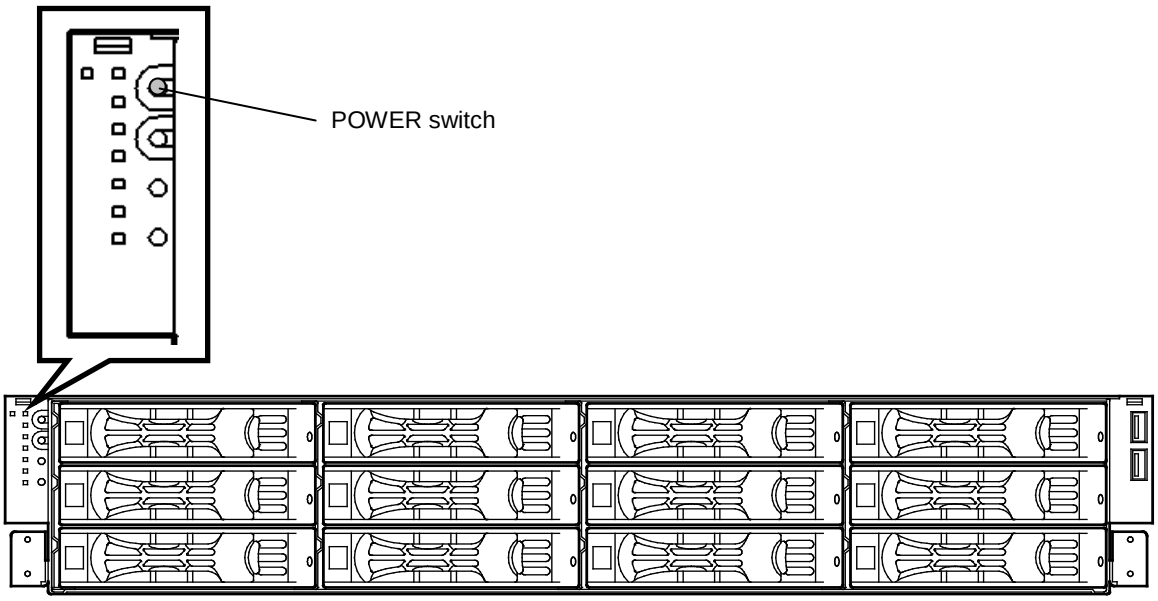
16x 2.5-inch disk drive model



26x 2.5-inch disk drive model



26x 2.5-inch disk drive model



While the logo is being displayed, the self-diagnostic program (POST) runs and diagnoses the hardware. For details, refer to *Chapter 3 (1.1.1 POST sequence)*.

1.1 POST

POST (Power-On Self-Test) is a self-diagnostic program stored in the server as standard. POST automatically runs immediately after the server is turned on and checks the motherboard, memory, processor (CPU), keyboard, and mouse. POST also displays the start-up messages of different utilities during the operation.

Usually, you do not need to check the contents of POST. However, check messages displayed at POST in the following cases.

- When introducing a server
- If you suspect a failure
- When you hear beep many times during the time between Power ON and OS startup
- When any error message is displayed

1.1.1 POST sequence

Explains how POST runs in order.

1. When the server is turned on, POST runs.

   As factory settings, the logo appears on the screen during POST.

   Note Keyboard becomes operable after the logo appears.

2. If **Enabled** is specified for **Password On Boot** in **Security** menu of SETUP, you will be prompted to enter password after the logo is displayed. If you enter the incorrect password three times consecutively, POST aborts. (You can no longer proceed.) In this case, power off the server, and power it on.

   Important **Do not set a password before OS is installed.**

3. If <Esc> key is pressed, the logo disappears and the details of POST are displayed.

   Tips If **Quiet Boot** is **Disabled** from **Boot** menu in BIOS settings, the logo is not displayed without requiring <ESC> key to be pressed.

4. POST displays several types of message. These messages let you know that the installed CPU or connected keyboard and mouse are detected.

5. After a while, the following message is displayed on the screen.

```
Press <F2> SETUP, <F3> Internal Flash Memory, <F4> ROM Utility, <F12> Network
```

By pressing the designated function key following messages, you can call the functions below upon completion of POST.

<F2> key: Run BIOS Setup Utility (SETUP). For information on the SETUP, refer to *Chapter 2 (1. System BIOS)* in "*Maintenance Guide*".

<F3> key: Run EXPRESSBUILDER from Internal Flash Memory (optional). For information on EXPRESSBUILDER, refer to *Chapter 3 (4. EXPRESSBUILDER)*.

Note

- If the optional Internal Flash Memory is not installed in the system, <F3> key message will not be displayed.
- <F3> key must be pressed within 5 seconds of the message being displayed.
- Note that the server will not boot from Internal Flash Memory even if it is specified to do so by pressing <F3> key, as long as a bootable CD/DVD-ROM is set on the drive.

<F4> key: Run Offline Tools. For information on Offline Tools, refer to Chapter 1 Maintenance (9. Offline Tools) in "Maintenance Guide".

<F12> key: Boot from network.

If a controller which has its dedicated BIOS such as a RAID Controller board is installed, a message that prompts you to start the dedicated utility to set each board is displayed.

Example: If an optional RAID Controller is installed

```
Press <Ctrl> <H> for Web BIOS
```

The utility starts by pressing <Ctrl> + <H> keys.

For details on the utility, refer to the manual supplied with each optional board.

Depending on the configuration, the message "Press Any Key" might appear to prompt a key entry. This is a behavior of the BIOS of the optional board. Continue to operate after checking the manual of the optional board.

The OS starts when POST is completed.

1.1.2 POST error messages

When POST detects an error, it displays an error message on the screen or beeps for some errors. For descriptions of error messages, causes, and countermeasures, refer to *Chapter 3 (1. POST Error Message) in* "*Maintenance Guide*".

Important

Take notes on the messages displayed before consulting with your maintenance service company. Alarm messages are useful information for maintenance.

2. System BIOS Setup

This section describes how to configure Basic Input Output System (BIOS).

Before you install the server and add or remove optional devices, make sure you have read and understood this section to configure properly.

2.1 Overview

SETUP is a utility to do basic hardware settings. This utility is pre-installed in the Internal Flash Memory in the server as standard and can be run without requiring a media for boot.

In most of cases, the SETUP was configured for optimal performance before the server was shipped to you. Therefore, in most of cases, you should not need to use the SETUP utility. **Use only when the case applies to any of cases described in *Chapter 3 (2.4 Cases that Require Configuration)*.**

2.2 Starting and Exiting SETUP Utility

2.2.1 Starting SETUP Utility

Run POST following *Chapter 3 (1.1.1 POST sequence)*.

After a while, the following message will be displayed on the lower left of the screen.

```
Press <F2> SETUP, <F3> Internal Flash Memory, <F4> ROM Utility, <F12> Network
```

If you press the <F2> key at this time, SETUP runs and displays the **Main** menu upon completion of POST. (You can also press the <F2> key while the NEC logo appears to display the **Main** menu.)

Important **If password is set, you will be prompted to enter password at next startup of SETUP. (The timing when prompt appears depends on setting of password.) Up to three password entries are accepted. If you enter incorrect password consecutively three times, the system halts (you can no longer proceed). In this case, power off the server once, then power it on.**

2.2.2 Exting SETUP Utility

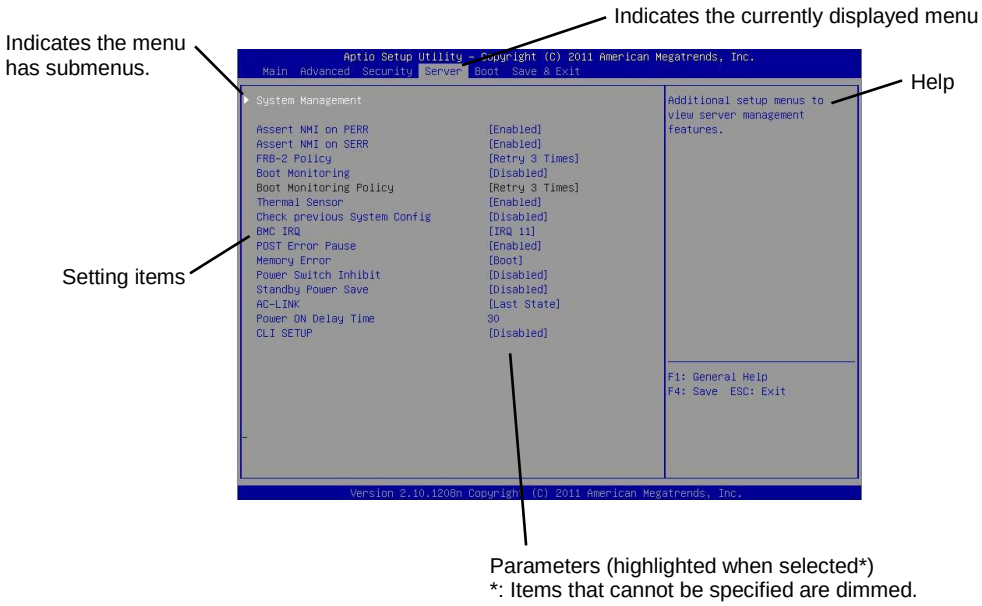
To exit SETUP after saving parameters, select **Save & Exit → Save Changes and Exit**.

To exit SETUP without saving parameters, select **Save & Exit → Discard Changes and Exit**.

Important **To restore the default value, select Save & Exit → Load Setup Defaults. (The default value might be different from the factory setting.)**

2.3 Description on On-Screen Items and Key Usage

This section shows display examples and how to control the key. Use the keyboard to work with the SETUP utility.

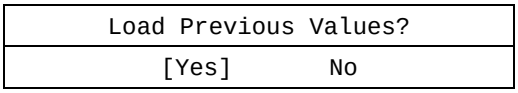

Indicates the currently displayed menu
Indicates the menu has submenus.
Help
Setting items
Parameters (highlighted when selected*)
*: Items that cannot be specified are dimmed.
Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Main Advanced Security Server Boot Save & Exit
System Management
Assert NMI on PERR [Enabled]
Assert NMI on SERR [Enabled]
FRB-2 Policy [Retry 3 Times]
Boot Monitoring [Disabled]
Boot Monitoring Policy [Retry 3 Times]
Thermal Sensor [Enabled]
Check previous System Config [Disabled]
BMC IRQ [IRQ 11]
POST Error Pause [Enabled]
Memory Error [Boot]
Power Switch Inhibit [Disabled]
Standby Power Save [Disabled]
AC-LINK [Last State]
Power ON Delay Time 30
CLI SETUP [Disabled]
Additional setup menus to view server management features.
F1: General Help
F4: Save ESC: Exit
Version 2.10.1208m Copyright (C) 2011 American Megatrends, Inc.

- Cursor keys (<↑>, <↓>)
  Select an item displayed on the screen. If characters of an item are highlighted, that means the item is currently selected.
- Cursor keys (<←>, <→>)
  Select top menus including **Main**, **Advanced**, **Security**, **Server**, **Boot**, and **Save & Exit**.
- <–> key/<+> key
  Change the value (parameter) of the selected item. You cannot use this key when a menu which has ▶ on the left is selected.
- <Enter> key
  Press this key to confirm the selected parameter.
- <Esc> key
  Press this key to cancel pop up menu. In sub menu, pressing this key takes you to the previous screen. In top menu, press this key takes the following window is displayed. If you select **Yes**, the SETUP closes without saving the changed parameters.

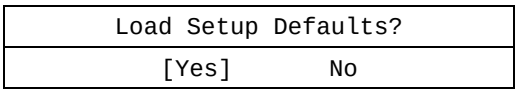
Quit without saving?
[Yes] No

- <F1> key
  Press this key to display help information. If you need help using the SETUP, press this key. Press the <Esc> key to go back to the original screen.

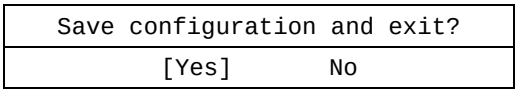
- <F2> key
  If you press this key, the following window appears. If you select **Yes**, the previous parameter(s) are restored. However if you save parameter(s) using [Save Changes], the saved parameter(s) are restored.



- <F3> key
  If you press this key, the following window appears. If you select **Yes**, restore the parameters of the currently selected item to the default setting. (**This might be different from the parameters configured before shipment.**)



- <F4> key
  If you press this key, the following window appears. If you select **Yes**, the parameter you configured is saved and SETUP closes.



2.4 Cases that Require Configuration

Only if a case applies to any of following cases, use the SETUP utility to change a parameter which was configured as factory setting. Other than cases described below, do not change the settings. A list of SETUP parameters and factory settings are described in ***Chapter 2 (1. System BIOS)* in "*Maintenance Guide*".**

Category	Description	Setting of parameter	Remark
Basic	Change date and time	Configure date and time **Main → System Date** **Main → System Time**	Configurable on OS
	On NumLock at power ON	**Boot → Bootup Numlock State → On**	
	Off the function to display the logo during POST	**Boot → Quite Boot → Disabled**	By pressing the <Esc> key, prevent the display of the logo.
Memory	Memory configure after add or change DIMM	**Advanced → Memory Configuration → Memory Retest → Yes**	After rebooting, **Memory Retest** changes **No** automatically.
	Use memory RAS feature	Change to RAS mode **Advanced → Memory Configuration → Memory RAS Mode**	You can select **Mirroring**, **Lock Step**, or **Sparing**.
Optional board	Disable Option ROM Scan of installed option board	**Advanced → PCI Configuration → PCI Device Controller and Option ROM Settings → PCIXX Slot Option ROM → Enabled**	*XX* is PCI slot number of the option board
Boot	Change the boot order of devices	Change the boot priority **Boot → Boot Option Priorities**	When you use EXPRESSBUILDER, set **CD/DVD** to the highest priority.
	Use remote power on feature (via modem)	**Advanced → Advanced Chipset Configuration → Wake On Ring → Enabled**	
	Use remote power on feature (via RTC alarm)	**Advanced → Advanced Chipset Configuration → Wake On RTC Alarm → Enabled**	
	Use console redirection feature	**Advanced → Serial Port Configuration → Console Redirection Setting →** Change respective setting.	
Security	Set a password to restrict operation of SETUP Utility	Set a password **Security → Administrator Password** **Security → User Password**	If password is set, a message to enter password is displayed at next time SETUP is launched.
	Set a password to restrict Boot	**Security → Password On Boot → Enabled**	You can select this parameter after you set password.
UPS Powerlink	When the server is supplied with power from UPS, always turn on the power.	**Server → Power Control Configuration → AC-LINK → Power On**	
	If it is turned off by using POWER switch, leave it OFF even when UPS supplies power.	**Server → Power Control Configuration → AC-LINK → Last State**	
	Keep the power OFF even when UPS supplies power.	**Server → Power Control Configuration → AC-LINK → Stay off**	

Password

If you have set a password, a message prompt you to enter password will be displayed from the next time.

```
Enter password [                ]
```

You can attempt password entry up to 3 times. **If you entered a wrong password 3 times, operation stops.** (You cannot operate further.) Turn off the power.

Saving changes

If you finish configuration, select **Save & Exit** and then **Save Changes and Exit** to save changes and exit.

If you wish to exit without saving the changed parameters, select **Save & Exit** and then **Discard Changes and Exit**.

Or if you wish to restore the setting to default values, select **Save & Exit** and then **Load Setup Defaults**.

(**The default value might be different from the factory setting.**)

3. EXPRESSSCOPE ENGINE 3

3.1 Overview

EXPRESSSCOPE Engine 3 provides a variety of features using BMC (Baseboard Management Controller), which is a system management LSI.

EXPRESSSCOPE Engine 3 monitors the power unit, fans, temperature, and voltage of the server. If you have the management LAN port connected to the network, you can remotely perform the following over a web browser or SSH client:

- Manage the server
- Remotely control the keyboard, video, and mouse (KVM)*
- Remotely access a CD/DVD/floppy disk/ISO image/USB memory*.

***** To enable this feature, the optional license for remote management (N8115-04) is required.

3.2 EXPRESSSCOPE ENGINE 3 Network configuration

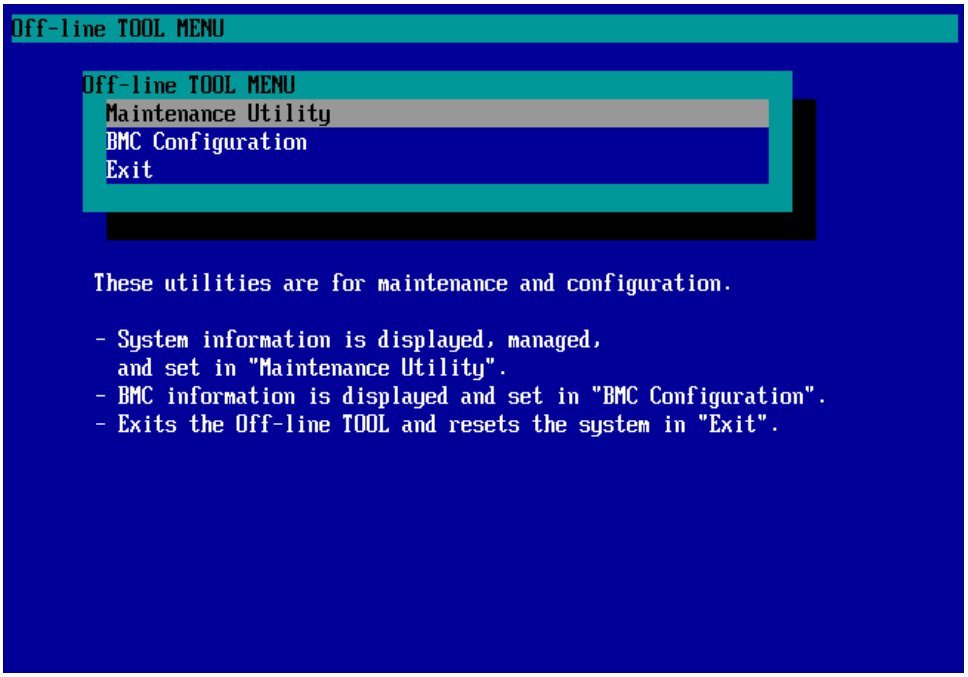
To enable EXPRESSSCOPE Engine 3 to be used via network, network configuration is required. Below is an example of the configuration procedure which enables EXPRESSSCOPE Engine 3 to be used via a web browser.

1. Run POST following *Chapter 3 (1.1.1 POST sequence)*. Wait until the following message appears on the lower left of the screen.

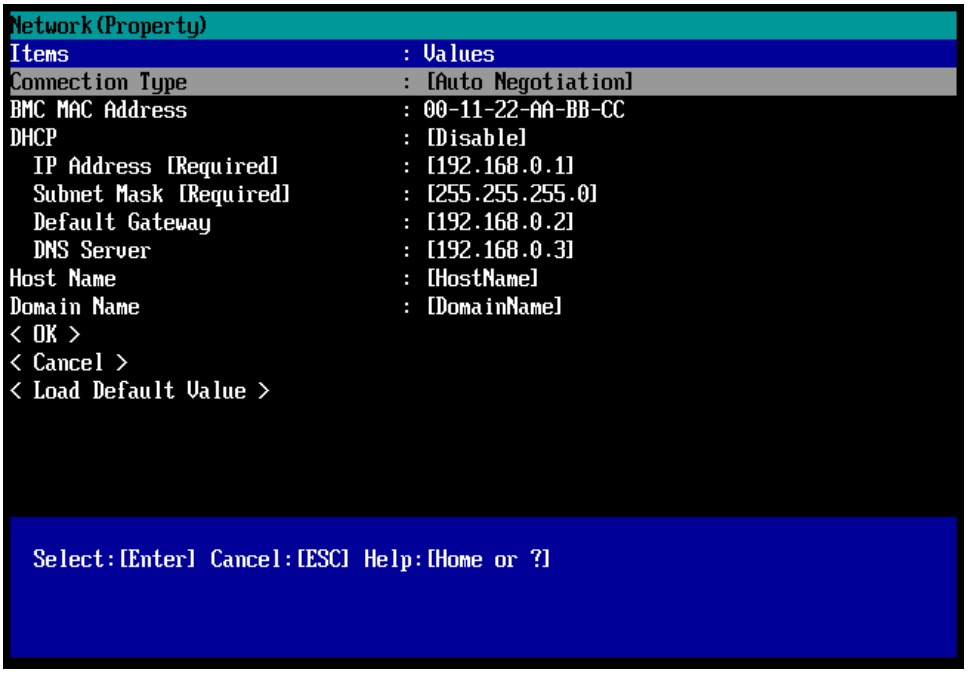
   ```
   Press <F2> SETUP, <F3> Internal Flash Memory, <F4> ROM Utility, <F12> Network
   ```

2. If you press the <F4> key at this time, ROM utility starts upon completion of POST. You can also press the <F4> key while the NEC logo is being displayed to open the Off-line TOOL MENU screen.
3. The keyboard selection screen appears. Select your keyboard type.
   After that, the Off-line TOOL MENU screen appears. On this screen, specify the network settings for EXPRESSSCOPE Engine 3.

4. When the Off-line TOOL MENU appears, select **BMC Configuration**, **BMC Configuration**, **Network**, and then **Property**.


Off-line TOOL MENU
Off-line TOOL MENU
Maintenance Utility
BMC Configuration
Exit
These utilities are for maintenance and configuration.
- System information is displayed, managed,
and set in "Maintenance Utility".
- BMC information is displayed and set in "BMC Configuration".
- Exits the Off-line TOOL and resets the system in "Exit".

5. If **Property** is selected, the following screen is displayed. On this screen, specify whether to use DHCP and if DHCP is not used, configure IP Address/Subnet Mask.


Network(Property)
Items : Values
Connection Type : [Auto Negotiation]
BMC MAC Address : 00-11-22-AA-BB-CC
DHCP : [Disable]
IP Address [Required] : [192.168.0.1]
Subnet Mask [Required] : [255.255.255.0]
Default Gateway : [192.168.0.2]
DNS Server : [192.168.0.3]
Host Name : [HostName]
Domain Name : [DomainName]
< OK >
< Cancel >
< Load Default Value >
Select:[Enter] Cancel:[ESC] Help:[Home or ?]

6. Connect the LAN cable to the management LAN connector in order to connect to the network. It will be available for use if you access EXPRESSSCOPE Engine 3 via Web browser from PC for management according to the setting.

4. EXPRESSBUILDER

EXPRESSBUILDER helps you to install Windows or maintain the server.

4.1 Features of EXPRESSBUILDER

EXPRESSBUILDER provides the following features.

Features	Descriptions
Setup (Windows reinstallation)	Installs Windows on your server. Easily completes the process from RAID configuration to installation of applications. To use this feature, select **Os installation** in the menu after boot.
Storage of software*	Stores various bundled software (such as NEC ESMPRO Agent).
Maintenance	Diagnoses your server system. To use this feature, select **Tool menu** in the menu after boot.
Storage of documents*	Stores various documents (including "*User's Guide*", "*Installation Guide*" and "*Maintenance Guide*").

* Documents and some software components are not stored in N8115-05 Internal Flash Memory (option).

4.2 Starting EXPRESSBUILDER

If you want to install Windows, start EXPRESSBUILDER by using any of the following.

EXPRESSBUILDER DVD:

Set the DVD on the drive and either turn on the server or restart the server by pressing <Ctrl> + <Alt> + <Delete>. EXPRESSBUILDER is booted from DVD.

N8115-10 Internal Flash Memory (option):

During POST, press <F3>. If you start with this option, **make sure that the media was removed from the drive.**

5. Installing Software Components

Continue to install software components such as OS.

Refer to the instructions below.

- Installation Guide (Windows)

6. Turning Off the Server

Turn off the server by using the following procedure. If the power cord of the server is connected to a UPS, refer to the documentation supplied with the UPS or the documentation for the application controlling the UPS.

1. Shut down the OS.
2. The server automatically turns off after the OS shuts down.
   Confirm that POWER LED is OFF.
3. Turn off peripheral devices.

Tips Hibernate function of Windows Server cannot be used. Do not set Hibernate at Windows shutdown.

NEC Express5800 Series
Express5800/R120d-2E

4 Appendix

1. **Specifications**

2. **PCI Configuration**

1. Specifications

Part Number			Express5800/R120d-2E (16x 2.5-inch drive model) N8100-1950F, N8100-1951F					
Processor Part Number			N8101-560F	N8101-561F	N8101-562F	N8101-563F	N8101-564F	N8101-565F	N8101-567F
CPU	Type		Intel® Xeon® processor E5-2403	Intel® Xeon® processor E5-2407	Intel® Xeon® processor E5-2420	Intel® Xeon® processor E5-2430	Intel® Xeon® processor E5-2430L	Intel® Xeon® processor E5-2450	Intel® Xeon® processor E5-2470
	Clock speed		1.80GHz	2.20GHz	1.90GHz	2.20GHz	2GHz	2.10GHz	2.30GHz
	Standard/Maximum		1/2						
	Intel® Samrt Cache (Last Level Cache)		10MB		15MB			20MB	
	Number of cores(C)/ Number of threads(T) (1CPU)		4C/4T		6C/12T			8C/16T	
Chipset			intel® C602 chipset						
Memory	Standard/Maximum		Not pre-installed / Unbuffered DIMM : 48GB (12x 4GB), Registered DIMM : 384GB (12x 32GB)						
	Memory module		DDR3L-1333 Unbufferd DIMM (4GB), DDR3L-1600 Registered DIMM (2/4/8/16GB), DDR3L-1066 Registered DIMM (32GB)						
	Maximum clock speed		1066MHz		1333MHz			1600MHz	
	Error check, correction		ECC, x4 SDDC, Memory LockStep (x8 SDDC)						
	Memory Sparing		Supported						
	Memory Mirroring		Supported						
Auxillary storage device	Drive bay	Standard	-						
		Maximum	2.5-inch HDD: SATA 16TB (16x 1TB), SAS 14.4TB (16x 900GB), 2.5-inch SSD: SATA 1.6TB (16x 100GB), SAS 6.4TB (16x 400GB) (with optional HDD cage installed)						
		Hot swap	Supported						
	Interface level / RAID System		SATA 3, 6Gb/s : RAID 0/1/10(Standard), RAID 5/6/50/60 (Option), SAS 6Gb/s : RAID 0/1/5/6/10/50/60 (Option)						
	Optical disk drive		Internal / external drive (Option)*1						
	FDD		Option: Flash FDD (1.44MB) *2						
	Device bay		1x 3.5-inch bay						
Expansion slots	Supported slot		1x PCI Express 3.0 (x8 lane, x8 socket) (Full height, 177mm in length) 1x PCI Express 3.0 (x8 lane, x8 socket) (Dedicated to RAID Controller) 2x PCI Express 3.0 (x4 lane, x8 socket) (Low profile[Bracket is Full height form], 197mm in length) 1x PCI Express 2.0 (x4 lane, x8 socket) (Low profile, 177mm in length) 1x PCI Express 2.0 (x1 lane, x4 socket) (Low profile, 177mm in length)						
Graphics	Chip / VideoRAM		Management controller chip / 32MB						
	Graphic display / resolution		16,770,000 colors: 640x480, 800x600, 1,024x768, 1,280x1,024						
Interface			2x Analog RGB (Mini D-Sub 15 pin, 1x Front, 1x Rear) 9x USB2.0 (2x Front, 4x Rear, 3x Internal), 1x Serial port (RS-232C compliant / D-Sub 9 pin, Serial port A, 1xRear, optional port can be used up tp two ports in total) 4x 1000BASE-T LAN connector (1000BASE-T/100BASE-TX/10BASE-T supported, RJ-45, 4x Rear) 1x Management LAN connector (100BASE-TX/10BASE-T supported, RJ-45, 1x Rear)						
Redundant power supply			Supported (option, hot-plug available)						
Redundant fan			Supported (option, hot-plug available)						
External dimensions (width x depth x height)			448.0mm × 696.3mm × 87.4mm (Front bezel, inner rails, projections are excluded) 482.0mm × 869.9mm × 88.0mm (Front bezel, inner rails, projections are included)						
Weight (Minimum*3 / Maximum)			18kg / 29kg (Rails included)						
Power supply			450W is pre-installed (N8100-1950F) / 800W is pre-installed (N8100-1951F) 450W/800W 80 PLUS® Platinum compliant (bipolar grounded outlet) (hot-plug available) (Maximum : 2 [Standard + option]) 100V/200V AC±10%, 50/60Hz						
Power consumption (100V at maximum configuration)	High-load state		782VA/770W	782VA/770W	782VA/770W	782VA/770W	782VA/770W	782VA/770W	782VA/770W
	40°C enviroment		782VA/770W	782VA/770W	782VA/770W	782VA/770W	782VA/770W	782VA/770W	782VA/770W
Environmental requirements Temperature			Operating: 10 to 40°C*4, Storage: -10 to 55°C						
Environmental requirements Humidity			Operating: 20 to 80%, Storage: 20 to 80% (No condensation either when operating or when stored)						
Main accessories			EXPRESSBUILDER(NEC ESMPRO Manager(Windows), NEC ESMPRO Agent,User's Guide(electronic document) included), Getting Started, Notes on Use, one-touch rack rail						
Installed OS			-						
Supported OSs			Microsoft Windows Server 2003 R2, Standard Edition (SP1 or later), Microsoft Windows Server 2003 R2, Enterprise Edition (SP1 or later), Microsoft Windows Server 2003 R2, Standard x64 Edition (SP1 or later), Microsoft Windows Server 2003 R2, Enterprise x64 Edition (SP1 or later), Microsoft Windows Server 2008 Standard (RTM, SP1 or later), Microsoft Windows Server 2008 Enterprise (RTM, SP1 or later), Microsoft Windows Server 2008 Standard (x64) (RTM, SP1 or later), Microsoft Windows Server 2008 Enterprise (x64) (RTM, SP1 or later), Microsoft Windows Server 2008 R2 Standard, Microsoft Windows Server 2008 R2 Enterprise,						

*1 If you do not intenend to install an internal DVD-ROM or internal DVD SuperMULTI in all system, prepare at least one external DVD-ROM per system for maintenance and OS reinstallation purposes.

*2 Prepare this if required. For the principal uses of a Flash FDD, refer to the notes on Flash FDD in the Maintenance Guide.

*3 Minimum configuration is 1x CPU, 1x DIMM, 1x HDD, 1x power supply.

*4 Operating: 10 to 35°C when three N8103-153 RAID Battery Backup Units are installed.

Part Number			Express5800/R120d-2E (26x 2.5-inch drive model) N8100-1952F		Express5800/R120d-2E (3.5-inch drive model) N8100-1953F	
Processor Part Number			N8101-560F	N8101-563F	N8101-560F	N8101-563F
CPU	Type		Intel® Xeon® processor E5-2403	Intel® Xeon® processor E5-2430	Intel® Xeon® processor E5-2403	Intel® Xeon® processor E5-2430
	Clock speed		1.80GHz	2.20GHz	1.80GHz	2.20GHz
	Standard/Maximum		1/2			
	Intel® Samrt Cache (Last Level Cache)		10MB	15MB	10MB	15MB
	Number of cores(C)/ Number of threads(T) (1CPU)		4C/4T	6C/12T	4C/4T	6C/12T
Chipset			intel® C602 chipset			
Memory	Standard/Maximum		Not pre-installed / Unbuffered DIMM : 48GB (12x 4GB), Registered DIMM : 384GB (12x 32GB)			
	Memory module		DDR3L-1333 Unbufferd DIMM (4GB), DDR3L-1600 Registered DIMM (2/4/8/16GB), DDR3L-1066 Registered DIMM (32GB)			
	Maximum clock speed		1066MHz	1333MHz	1066MHz	1333MHz
	Error check, correction		ECC, x4 SDDC, Memory LockStep (x8 SDDC)			
	Memory Sparing		Supported			
	Memory Mirroring		Supported			
Auxillary storage device	Drive bay	Standard	-			
		Maximum	2.5-inch HDD: SATA 26TB (26x 1TB), SAS 23.4TB (26x 900GB), 2.5-inch SSD: SATA 2.6TB (26x 100GB), SAS 10.4TB (26x 400GB) (with optional Rear HDD cage installed)		3.5-inch HDD: SATA 36TB (12x 3TB) 2.5-inch HDD: SATA 2TB (2x 1TB), SAS 1.8TB (2x 900GB), 2.5-inch SSD: SATA 200GB (2x 100GB), SAS 800GB (2x 400GB) (with optional Rear HDD cage installed)	
		Hot swap	Supported			
	Interface level / RAID System		SATA 3, 6Gb/s : RAID 0/1/10(Standard), RAID 5/6/50/60 (Option), SAS 6Gb/s : RAID 0/1/5/6/10/50/60 (Option)			
	Optical disk drive		External drive (Option)*1			
	FDD		Option: Flash FDD (1.44MB) *2			
	Device bay		-			
Expansion slots	Supported slot		1x PCI Express 3.0 (x8 lane, x8 socket) (Full height, 177mm in length) 1x PCI Express 3.0 (x8 lane, x8 socket) (Dedicated to RAID Controller) 2x PCI Express 3.0 (x4 lane, x8 socket) (Low profile[Bracket is Full height form], 197mm in length) 1x PCI Express 2.0 (x4 lane, x8 socket) (Low profile, 177mm in length) 1x PCI Express 2.0 (x1 lane, x4 socket) (Low profile, 177mm in length)			
Graphics	Chip / VideoRAM		Management controller chip / 32MB			
	Graphic display / resolution		16,770,000 colors: 640x480, 800x600, 1,024x768, 1,280x1,024			
Interface			1x Analog RGB (Mini D-Sub 15 pin, 1x Front, 1x Rear) 9x USB2.0 (2x Front, 4x Rear, 3x Internal), 1x Serial port (RS-232C compliant / D-Sub 9 pin, Serial port A, 1xRear, optional port can be used up tp two ports in total) 4x 1000BASE-T LAN connector (1000BASE-T/100BASE-TX/10BASE-T supported, RJ-45, 4x Rear) 1x Management LAN connector (100BASE-TX/10BASE-T supported, RJ-45, 1x Rear)			
Redundant power supply			Supported (option, hot-plug available)			
Redundant fan			Supported (option, hot-plug available)			
External dimensions (width x depth x height)			448.0mm × 696.3mm × 87.4mm (Front bezel, inner rails, projections are excluded) 482.0mm × 869.9mm × 88.0mm (Front bezel, inner rails, projections are included)			
Weight (Minimum*3 / Maximum)			17kg / 31kg (Rails included)		17kg / 33kg (Rails included)	
Power supply			800W is pre-installed, 800W 80 PLUS® Platinum compliant (bipolar grounded outlet) (hot-plug available) (Maximum : 2 [Standard + option]) 100V/200V AC±10%, 50/60Hz			
Power consumption (100V at maximum configuration)		High-load state	889VA/877W	889VA/877W	808VA/797W	808VA/797W
		40°C enviroment	889VA/877W	889VA/877W	808VA/797W	808VA/797W
Environmental requirements Temperature			Operating: 10 to 40°C *4, Storage: -10 to 55°C			
Environmental requirements Humidity			Operating: 20 to 80%, Storage: 20 to 80% (No condensation either when operating or when stored)			
Main accessories			EXPRESSBUILDER(NEC ESMPRO Manager(Windows), NEC ESMPRO Agent,User's Guide(electronic document) included), Getting Started, Notes on Use, one-touch rack rail			
Installed OS			-			
Supported OSs			Microsoft Windows Server 2003 R2, Standard Edition (SP1 or later), Microsoft Windows Server 2003 R2, Enterprise Edition (SP1 or later), Microsoft Windows Server 2003 R2, Standard x64 Edition (SP1 or later), Microsoft Windows Server 2003 R2, Enterprise x6 Microsoft Windows Server 2008 Standard (RTM, SP1 or later), Microsoft Windows Server 2008 Enterprise (RTM, SP1 or later), Microsoft Windows Server 2008 Standard (x64) (RTM, SP1 or later), Microsoft Windows Server 2008 Enterprise (x64) (RTM, SP1 or later), Microsoft Windows Server 2008 R2 Standard, Microsoft Windows Server 2008 R2 Enterprise,			

*1 If you do not intenend to install an internal DVD-ROM or internal DVD SuperMULTI in all system, prepare at least one external DVD-ROM per system for maintenance and OS reinstallation purposes.

*2 Prepare this if required. For the principal uses of a Flash FDD, refer to the notes on Flash FDD in the Maintenance Guide.

*3 Minimum configuration is 1x CPU, 1x DIMM, 1x HDD, 1x power supply.

*4 Operating: 10 to 35°C when three N8103-153 RAID Battery Backup Units are installed.

2. PCI Configuration

Bus Number

If **Enabled** (factory setting) is specified for **Advanced** → **PCI Configuration** → **PCI Bus Static Allocation** in BIOS SETUP, PCI bus numbers are assigned as shown below:

Range of PCI bus number	Onboard / PCI board
8(08h)	Onboard LAN 1/2/3/4 controller
16(10h) - 31(1Fh)	PCI card installed in slot PCI1A
32(20h) - 47(2Fh)	PCI card installed in slot PCI1B
48(30h) - 63(3Fh)	PCI card installed in slot PCI2B
64(40h) - 79(4Fh)	PCI card installed in slot PCI3B
80(50h) - 95(5Fh)	PCI card installed in slot PCI1C
96(60h) - 124(7Ch)	PCI card installed in slot PCI2C
125(7Dh)	Onboard VGA controller

( ): Hexadecimal notation

If **Disabled** is specified for **Advanced** → **PCI Configuration** → **PCI Bus Static Allocation** in BIOS SETUP, PCI bus numbers are not unique, but assigned in the order as shown below:

Order	Onboard / PCI board
1	PCI board installed in slot PCI1A
2	PCI board installed in slot PCI1B
3	PCI board installed in slot PCI2B
4	PCI board installed in slot PCI3B
5	Onboard LAN 1/2/3/4 controller
6	Onboard VGA controller
7	PCI board installed in slot PCI1C
8	PCI board installed in slot PCI2C

Onboard LAN

Correspondence between device numbers and function numbers of onboard LAN is as shown below:

Onboard LAN	Device number (Device#)	Function number (Function#)
1	0	0
2	0	1
3	0	2
4	0	3

Interrupt Request

Interrupt requests are assigned as shown below. Find an appropriate one to install a PCI card.

"PCI1A: INTA" denotes INTA of PCI card installed in PCI slot 1A.
If the operating system and device driver support MSI/MSI-X (Message Signaled Interrupts), assignments differ from those shown in the table below.

IRQ/PIRQ	Peripherals (Controller)	IRQ/PIQR	Peripherals (Controller)
0(00h)	System timer	24(18h)	—
1(01h)	—	25(19h)	—
2(02h)	—	26(1Ah)	PCI1A: INTA
3(03h)	COM2 serial port	27(1Bh)	—
4(04h)	COM1 serial port	28(1Ch)	PCI1A: INTB
5(05h)	—	29(1Dh)	PCI1A: INTC
6(06h)	—	30(1Eh)	PCI1A: INTD
7(07h)	—	31(1Fh)	Primary IOAT
8(08h)	Realtime clock (RTC)	32(20h)	—
9(09h)	Microsoft ACPI-Compliant System (SCI)	33(21h)	—
10(0Ah)	—	34(22h)	—
11(0Bh)	Motherboard resources (BMC)	35(23h)	—
12(0Ch)	—	36(24h)	—
13(0Dh)	Numeric data processor	37(25h)	—
14(0Eh)	—	38(26h)	—
15(0Fh)	—	39(27h)	Primary IOAT
16(10h)	Onboard LAN1/3 PCI1C: INTB PCI2C: INTA	40(28h)	PCI1B: INTA
17(11h)	Onboard LAN2/4 PCI1C: INTC PCI2C: INTB	41(29h)	PCI2A: INTA
18(12h)	Onboard VGA/SMBus PCI1C: INTD PCI2C: INTC	42(2Ah)	PCI3A: INTA
19(13h)	Onboard SATA1/2 PCI1C: INTA PCI2C: INTD	43(2Bh)	—
20(14h)	—	44(2Ch)	PCI1B: INTB PCI2B: INTD PCI3B: INTC
21(15h)	—	45(2Dh)	PCI1B: INTC PCI2B: INTB PCI3B: INTB
22(16h)	EHCI#2 (USB)	46(2Eh)	PCI1B: INTD PCI2B: INTC PCI3B: INTD
23(17h)	EHCI#1 (USB)	47(2Fh)	—

( ): Hexadecimal notation

Properties shown on Windows Device Manager

PCI slot numbers shown on **Device Manager → Properties → General** tab correspond to actual PCI slot numbers as shown below:

PCI slot	Indication on Properties page	
	Windows Server 2003	Windows Server 2008 Windows Server 2008 R2
PCI1A	PCI Slot 26	PCI Slot 1
PCI1B	PCI Slot 27	PCI Slot 2
PCI2B	PCI Slot 43	PCI Slot 3
PCI3B	PCI Slot 59	PCI Slot 4
PCI1C	PCI Slot 28	PCI Slot 5
PCI2C	PCI Slot 44	PCI Slot 6